

Cost-effective management tools for ensuring food quality and safety

FOR SMALL AND MEDIUM AGRO-INDUSTRIAL ENTERPRISES



Facilitators' manual



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Technical Coordinators

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Foreword

The Rural Infrastructure and Agro-Industries Division (AGS) of FAO works to improve and strengthen the capacities of small and medium agro-industries, the enterprises that provide them with services and materials and the relevant support organizations in order to ensure food quality and safety. It carries out these activities using an approach that integrates the different factors affecting the capacity of a business to produce foods to meet the demands of the market according to recognized standards, while maintaining and increasing the profitability and viability of the business. Management and technical aspects must be integrated within a practical and cost-effective approach. This ensures that higher incomes, sources of jobs and the food security of the rural population are also promoted.

The training manual entitled *Cost-effective management tools for ensuring food quality and safety – for small and medium agro-industrial enterprises* focuses on these objectives.

This manual is the result of a collaborative effort by technical staff of the Rural Infrastructure and Agro-Industries Division of FAO. It is based on case studies carried out in Bolivia and El Salvador on opportunities for the improvement of capacity of small- and medium-scale food processing enterprises, through training to meet the demands of the market.

These case studies, which were carried out as part of the FAO programme ‘Agribusiness Development: Small and Medium Post-production Enterprises’, identified the training needs of small and medium fruit and vegetable agro-industries. This sector had been chosen as representative of the food industries operating in Latin America.

In Bolivia, a range of agro-industries was evaluated. These produced: (i) processed dried fruits, jams and/or fruit pulps, particularly pineapple and peaches; (ii) processed vegetables such as faba beans and garlic; (iii) various processed products such as pickles.

In El Salvador, the study focused on the development of products such as tomato-based foods, fruit juices and nectars (including peaches, apples, grapes and tropical fruits), as well as other fruit and vegetable products. This made it possible to identify problems common to the different enterprises, such as low-quality raw materials, inefficient processing operations, lack of knowledge of the relevant quality and safety standards and their implementation and lack of entrepreneurial vision. There was a consensus among small-scale entrepreneurs that these problems could be overcome by implementing innovative training strategies. This consensus led to the idea of preparing this manual.

The manual is divided into four modules, each subdivided into themes. Module 1 discusses the use of market information as a tool for business decision-making. Module 2 covers systems and tools for improving the management of food quality and safety in agro-industry. Module 3 focuses on the principles of quality

management in small and medium agro-industrial enterprises. Module 4 discusses planning as a tool for the management of food quality and safety.

This manual includes case studies, exercises and bibliographic references, as well as a trainer's guide, PowerPoint presentations, appendices, further reading and links of interest.

The purpose of this manual is to assist trainers and entrepreneurs wishing to use the material for self-learning. With this manual, FAO can now provide the small and medium agro-industry sector in developing countries with an important tool for improving its competitiveness and its capacity to deliver high-quality products to consumers.

The English version has been revised to include references, recommended reading and links suitable for English readers. In Module 2, information on standards and regulations relating to quality and safety has been included in order to provide norms that are relevant worldwide.

Geoffrey C. Mrema

Director

Rural Infrastructure and Agro-Industries Division

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The support of Doyle Baker and Gavin Wall (Rural Infrastructure and Agro-Industries Division, FAO) was also invaluable. Our thanks also go to Cadmo Rosell for the Spanish editing and style review, to Lynette Chalk for formatting the text and to Claudia Bastar and Donna Kilcawley for their administrative assistance.

For the English version, special thanks to William Edwardson for the translation, Malcom Hall, Joan Venanzi and Andrea Broom for editing, Lynette Chalk for formatting, Maaïke Loogman for the added material, Claudia Bastar for her administrative assistance and Larissa D'Aquilio for the production coordination.

General information on the manual

GENERAL OBJECTIVE

Training courses based on this manual are designed to build the capacity of small and medium enterprises in the agro-industrial sector in order to improve quality and safety management and to achieve greater competitiveness and sustainability over the long term.

SPECIFIC OBJECTIVES

The specific objectives of the manual are to:

- Identify the characteristics and usefulness of some basic tools for collecting, processing and analysing market information.
- Present the sequence of steps to be followed for market research and preparing plans.
- Emphasize the importance of a proactive approach to quality and safety within the agro-industrial enterprise.
- Review the tools and systems available for improved food quality and safety assurance throughout the agrifood chain.
- Illustrate the principles of product traceability and its importance as a support tool in quality and safety improvement programmes.
- Underline the importance of quality management for implementing initiatives to improve product quality and safety.
- Outline the use of planning principles as a tool for improving quality and safety.

EXPECTED RESULTS

We hope that those who develop courses based on this manual will:

- adapt its content using examples and exercises based on the local, regional and national business and institutional context;
- direct and advise on the development of practical exercises and activities so that the themes covered in the manual reflect and promote direct improvements in quality and safety management in small and medium enterprises in the agro-industrial sector;
- promote exchanges of experience among small and medium entrepreneurs as a valuable resource for generating new knowledge and facilitating learning.

TARGET AUDIENCE

This manual is aimed at public- and private-sector institutions with responsibilities for the promotion of training, technical assistance and consultancy initiatives, as well as for efforts to improve quality and safety management. This should create opportunities for small and medium enterprises in the agro-industrial sector in local, regional and/or international markets. The users of this manual are likely to include:

- business associations;
- individual small and medium enterprises;
- technical and financial assistance centres;
- consultants;
- educational institutions;
- government institutions responsible for defining policy and programmes to support small and medium enterprises.

Even though the manual has been designed to support formal training courses, the material has been prepared in such a way that it can be used by individual learners under the supervision of a tutor who can provide clarification where necessary.

DESCRIPTION OF THE MANUAL

The manual is divided into four modules, which take at least 40 hours to cover and include classroom sessions and practical exercises using the material discussed in each module.

Each of the modules develops a number of different themes, which contribute to achieving the general and specific objectives of the manual. The modules, together with their respective themes, provide an integrated approach to quality and safety management in small and medium enterprises in the agro-industrial sector.

Figure 1 shows the content and sequence of the learning process used throughout the manual.

FIGURE 1
Sequence of the manual's content



Guidelines for facilitators

INTRODUCTION

The aim of the training process is to boost the technical and operational management skills of producers, entrepreneurs and other actors in the agrifood chain. Training is based on certain premises that guide the application of these skills and achievement of the learning objectives, including:

- development of technical capacity, starting with the personal experience of participants;
- learning from the best practices of others, without losing one's own identity;
- the importance of teamwork, which requires entrepreneurial qualities to be effective.

The practice of learning through experience common to entrepreneurs, as well as their interests, motivations and acquired knowledge, should all be taken into account. This is key to designing effective training processes that stimulate the development of individual and group potential.

These premises underpin this manual. The content is intended to reflect business realities. Case studies, which facilitate the exchange of experiences, and practical activities, which take into account individual and group experiences, are included to initiate a learning process that supports practical managerial improvements.

This section provides facilitators with a set of guidelines for using the manual and for preparing and implementing training courses. These courses are aimed at building the capacity of people involved in small and medium agro-industries for efficient quality and safety management.

WHAT DOES IT MEAN TO BE A FACILITATOR?

Facilitators are not a fountain of knowledge – they are people who undergo a process where they themselves learn, carry out research and produce knowledge. Their main task is to conduct, guide and facilitate the learning process. Facilitators should ideally possess the following characteristics, which are vital to the success of the training process.

Motivation

Facilitators must be willing to share their knowledge and experience with others.

Knowledge of the topic

Although nobody can provide what they do not have, a facilitator's mastery of the subject should extend beyond the material to be taught.

Communication skills

Facilitators should stimulate and motivate the audience, while transmitting the message effectively.

Listening and facilitating participation to generate a two-way learning process

This requires the use of methodologies that facilitate participation and exchanges of ideas among participants.

Flexibility

Facilitators should plan each session, while remaining open to making adjustments to their plans. Presentations should be geared to the level of the group and discuss the group's real interests on any specific theme. The facilitator should be consistent and flexible when making adjustments and always be attuned to the group's needs and requirements.

PREPARATION OF TRAINING COURSES BASED ON THE MANUAL

To be effective, the training process should be based on the training needs of the target audience to ensure that themes and activities strengthen the areas required for knowledge and skill development and to help to change attitudes towards specific tasks.

Prior to implementing the course, facilitators should conduct a general review of the training needs of the audience or target group. There are various ways of achieving this, depending on how the course is delivered. Useful tools for designing the course content to meet the needs of the audience include:

- i. meetings with potential participants;
- ii. registration forms asking participants to describe their interests;
- iii. a discussion with participants during an introductory session.

Prior to the course, facilitators should familiarize themselves with the content of the manual, its components and the proposed training methodologies, as well as the objectives of each module, the themes and the planned activities illustrated in Figure 1.

These aspects are described below.

DETAILED DESCRIPTION OF THE MANUAL CONTENT

The manual is divided into four modules.

MODULE 1: USE OF MARKET INFORMATION FOR IMPROVING QUALITY MANAGEMENT

Objectives

- To recognize the value of market information for improving the competitiveness of agro-industrial enterprises.
- To identify the characteristics and value of some basic tools for the collection, processing and analysis of market information.

- To understand the steps to follow for researching markets and preparing a marketing plan.

Theme 1: Market information needed by the company

- The enterprise and its relationship with the market.
- The importance of market information.
- The market information that needs to be collected.

Theme 2: How is market information collected?

- Research, collecting and processing information.
- Steps to follow for market research.

Theme 3: How is market information used?

- The marketing plan.
- The information flow within the enterprise.

MODULE 2: SYSTEMS AND TOOLS FOR IMPROVING QUALITY AND SAFETY MANAGEMENT IN AGRO-INDUSTRY

Objectives

- To recognize the importance of a proactive approach to quality and safety in an agro-industrial enterprise.
- To review the tools and systems available for ensuring food quality and safety throughout the agrifood chain.
- To illustrate the principles of product traceability and their importance as a support mechanism in food quality and safety programmes.

Theme 1: Management of food quality and safety in agro-industry

- Quality and safety assurance and maintenance are the responsibility of every actor in the chain.
- How to ensure food quality and safety.
- General review of programmes and standards for improving quality and safety management.
- Voluntary and mandatory initiatives in food safety and quality standards.

Theme 2: The importance of product traceability in quality and safety management

- The advantages of applying product traceability principles in agro-industrial enterprises.
- Steps in the implementation of product-tracking tools.
- Application of product traceability tools according to voluntary and mandatory standards.
- Considerations when adopting product traceability tools.
- Product traceability approaches.

MODULE 3: APPLICATION OF QUALITY MANAGEMENT PRINCIPLES IN SMALL AND MEDIUM AGRO-INDUSTRIAL ENTERPRISES

Objectives

- To illustrate the importance of the quality management principles for improving product quality and safety.
- To provide guidelines for the application of quality principles in small and medium agro-industrial enterprises.

Theme 1: Principles of quality management in small and medium agro-industrial enterprises

- General principles of quality management.

Theme 2: Leadership: the key to improving food quality and safety

- Entrepreneurial leadership.
- Leadership and planning in the agro-industrial enterprise.
- Leadership in communication of the enterprise's objectives.

Theme 3: The process approach and continual improvement: effective tools for food quality and safety management

- Management by process.
- The process approach to food quality and safety management.
- Continual improvement.
- The pathway to improvement.

Theme 4: Quality and safety management starting with suppliers

- Cooperation between actors as a precondition for quality and safety assurance throughout the supply chain.
- Fundamental factors for the development of sustainable cooperative relationships.
- Strengthening the client/supplier relationship.

MODULE 4: PLANNING AS A TOOL FOR IMPROVING QUALITY AND SAFETY MANAGEMENT

Objectives

- To describe the nature, purpose, advantages and constraints of planning in the context of small and medium agro-industrial enterprises.
- To provide guidelines for applying planning principles as a tool for improving quality and safety management.

Principal themes

- The importance of planning in the agro-industrial enterprise.
- How to analyse a company by evaluating its strengths, weaknesses, opportunities and threats.

- Planning in an agro-industrial enterprise.
- How to carry out the planning process in small and medium enterprises.

THE FORMAT OF THE MANUAL

All of the modules in this manual use the following format:

- Objectives of the module.
- Themes to be covered.
- Estimated time for development of the module.
- Expected results for each theme.
- List of support materials for the development of each theme.
- Case study.
- Reference reading for development of the theme.
- Exercise.
- Assessment.
- Summary of the module.

TRAINING METHODOLOGIES PROPOSED IN THE MANUAL

Guidelines are presented below on the proposed methodology for developing courses based on the content of this manual.

INTRODUCTORY SECTION

Facilitators should produce an introductory section to the course in which they present the objectives of the course and the course content, including:

- i. the modules and the themes to be developed;
- ii. the time required; and
- iii. the methodology to be used for covering the course material.

Prior to this, facilitators should carry out an initial exercise to evaluate participants' expectations and/or to create an environment in which participants feel motivated to take an active part in the course.

For this exercise, facilitators may be guided by Figure 2. For more details on group dynamics and tools for working in groups, please refer to the material in Module 3, Appendices 1, 4 and 5.

DEVELOPMENT OF THE CONTENT OF EACH MODULE

Figure 3 shows a general scheme of the suggested methodology for developing each module, which involves the following three steps:

Step 1: Introduction to the module

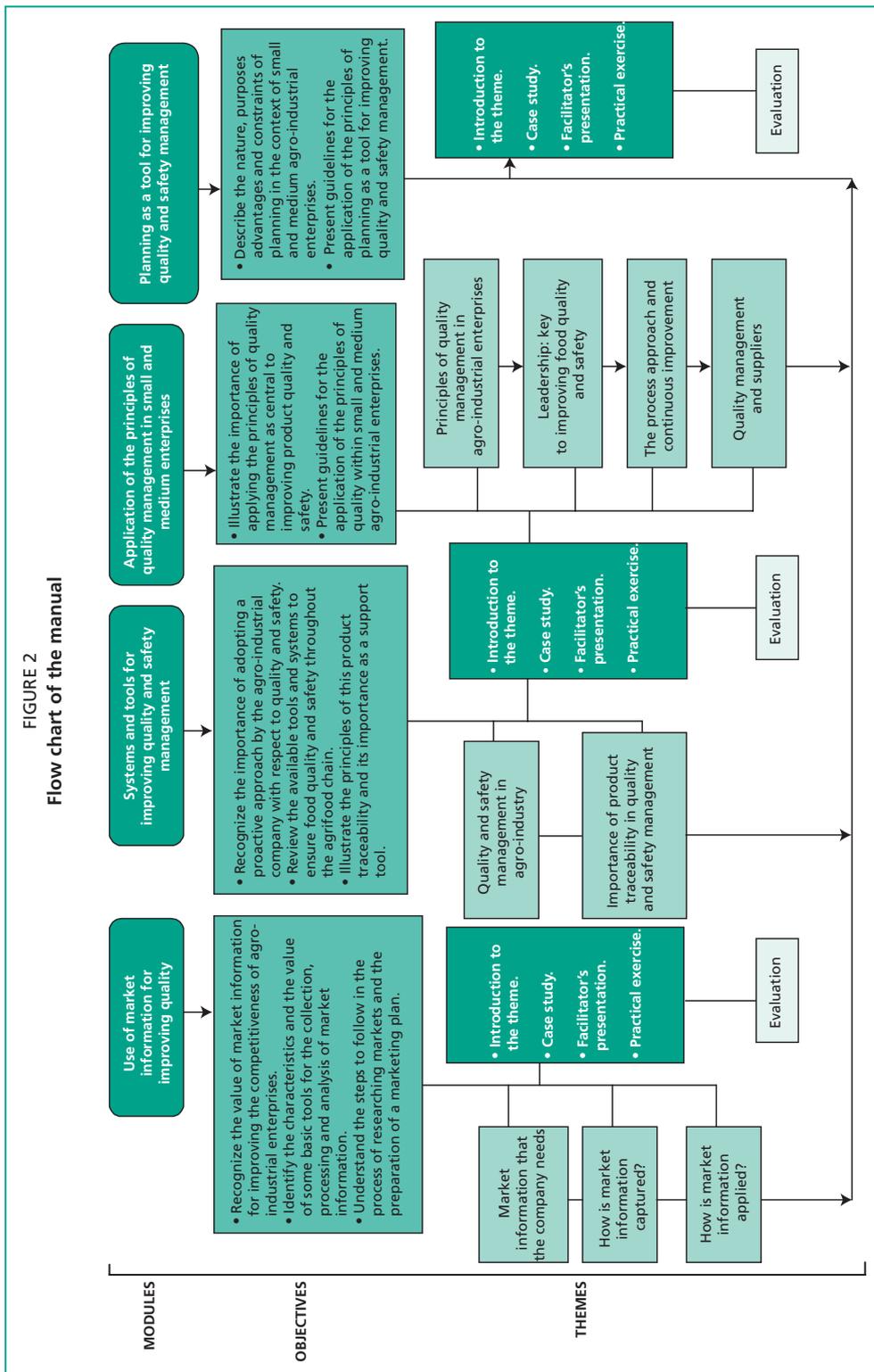
Step 2: Development of each theme

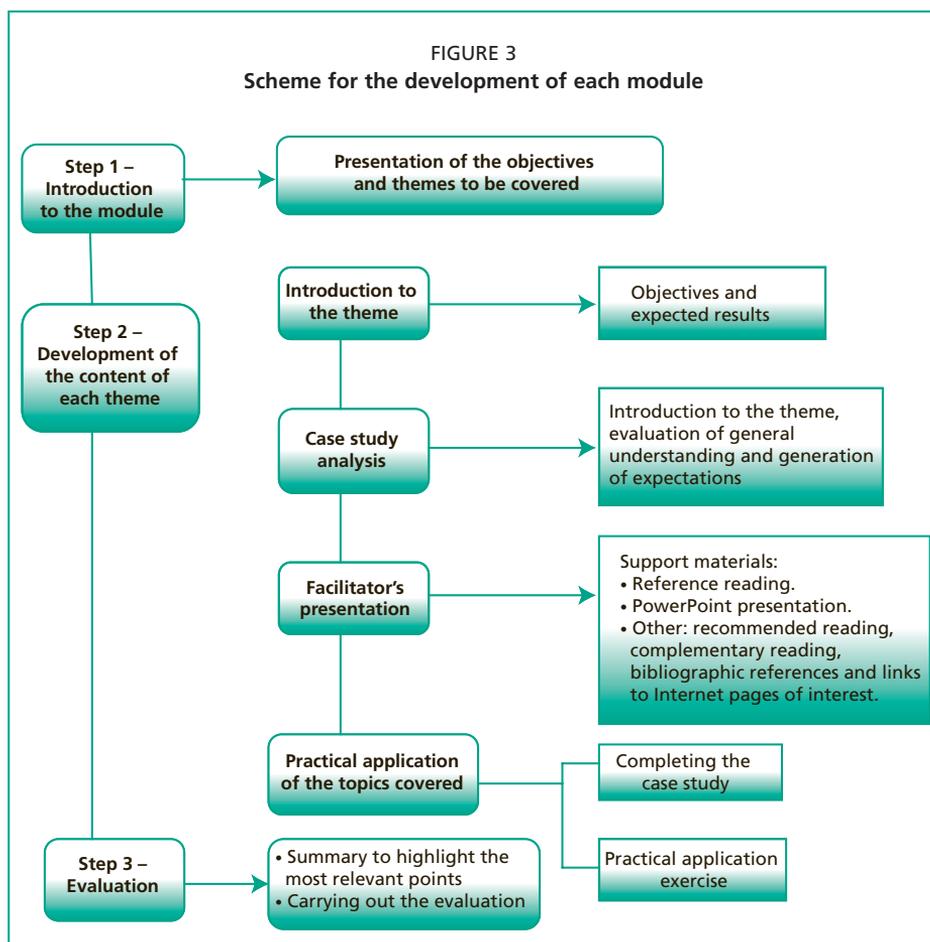
Step 3: Assessment

Each of the three steps is described below.

Step 1: Introduction to the module

The facilitator begins this session by explaining the objectives and themes to be covered in the module concerned.





Step 2: Development of each theme

The content of each theme is divided into four parts:

- introduction to the theme;
- case study (or studies);
- presentation and development of each theme by the facilitator;
- practical application of the topics reviewed.

Introduction to the theme

The facilitator introduces the theme explaining the expected results and describing the content.

Case study

The facilitator presents the theme and starts an open discussion on the topic in order to evaluate the participants' initial level of understanding. To this end, the facilitator presents a case study or situation on each theme. The facilitator

distributes a copy of the case study to the participants, either individually or in groups, and asks them to read the material and to prepare an analysis based on a set of criteria, which are specified in each case. Afterwards the participants present the results of this analysis in a plenary session. The facilitator should also carry out a review of the responses at the end of the theme sessions, modifying them in line with the topics discussed and the knowledge acquired during the sessions.

As a complement to reading and analysing the case studies, at some point during the sessions the facilitator should identify participants interested in sharing their experiences. This should help to develop the themes through the exchange of direct, practical knowledge.

Facilitator's presentation

The facilitator makes a short presentation on the theme, using the PowerPoint slides provided in each case. The facilitator has a range of support materials, including:

- **A reference text that the facilitator can use for developing each of the themes.** This text represents the main technical component of the theme to be covered.
- **Recommended reading.** For each theme a list of reading material has been selected to clarify doubts and enrich knowledge of the technical content. Depending on the themes in each module, the facilitator can extend coverage of topics that require more attention according to the defined training needs of each audience.
- **Bibliographic references.** At the end of each module there are bibliographic references, in which the technical content of each theme is developed.
- **Complementary texts.** For some of the themes, appendices to the manual are included. These are complementary texts that describe methodologies, team activities, etc.
- **Links to web pages of interest.** These links allow facilitators to explore the topic in more detail, clarify issues and enrich their understanding. Similarly, the facilitator can use this information for developing additional activities for participants, such as internet searches and further reading.

Practical exercises

These activities give the participants an opportunity to check their understanding of the topics covered and put their newly acquired knowledge into practice. Each theme includes two activities:

- **Completing the case study.** After developing the theme, the answers to the questions posed at the initial stage of the case study should be reviewed, corrected and enhanced by linking the answers to the topics covered under each theme. The facilitator should therefore organize a plenary session to review the participants' results.
- **Practical application exercise.** For each theme the participants should carry out a practical exercise, either individually or in groups, to improve their

understanding of the topic and apply the new knowledge in the context of their own company. If there is insufficient time during the course, some of the exercises could be carried out by participants outside the classroom sessions. *A short session could be organized for exchanges of experience on the results of the practical exercise, either at the end of the theme or as a preamble to the next theme to be covered.*

Step 3: Assessment

At the end of the theme, the facilitator should arrange a brief assessment to check the level of understanding and assimilation of the topics and elements covered. Each session includes a short summary, which the facilitator may use to highlight the most important topics covered under each theme as a preamble to the assessment.

FLEXIBILITY FOR DESIGNING COURSES AND TRAINING ACTIVITIES BASED ON THE COMPONENTS OF THE MANUAL

The modules may be expanded or reduced according to the type of audience and expectations to enable the facilitator to select the most appropriate topics or make the necessary adjustments.

The order of the modules should be respected. However, if any modifications are necessary, the facilitator should take care not to compromise the general understanding of the modules and themes in their logical sequence and should respect the learning methodology of this manual. Participation in all modules is essential in order to achieve the general objective of the course.

FINAL CONSIDERATIONS

To achieve the best results from the learning process, it is very important for facilitators to prepare ahead by studying the content of the modules and the way in which they are integrated in order to offer viable alternatives to all participants depending on their role in the agro-industrial chain. The following steps should therefore be followed.

1. Preparation

- Review in detail the proposed content for each module: the PowerPoint presentations, the reference reading for the facilitator, the case study and complementary texts for each theme and the associated appendixes.
- Review the recommended reading list and select texts that provide a deeper understanding of themes of special interest, depending on the objectives set for the course. If more study is required, the references at the end of each module may also be read.
- Review the web page links of interest included in the modules.
- Where facilitators with different specializations are used, each of them should have an overview of all the modules and themes that are to be developed during the course.

2. Planning

- Decide how to begin and end each work session.
- Devote the first 5–10 minutes of each session to: (i) describing the objectives of the session; (ii) ensuring that the participants understand and (iii) listening to their concerns.
- Agree a schedule for the group sessions, not only for group work but also for presentations in plenary sessions, and ensure that it is respected.
- Take into account the practical organizational aspects and the materials needed for each of the planned activities.
- Include the office supplies and equipment necessary for group activities: a projector for the PowerPoint presentations, flip charts and markers for flip charts.
- Prepare photocopies of the case studies.
- Copy the initial assessments by module.

3. Assessment

- Achievement of the objectives of each module and theme.
- Scheduled duration.

Cost-effective management tools for ensuring food quality and safety

FOR SMALL AND MEDIUM AGRO-INDUSTRIAL ENTERPRISES

The purpose of this manual is to improve and build the capacities of small and medium agro-industrial enterprises in order to guarantee the quality and safety of food products. The approach integrates the different factors that affect the capacity of a business to produce foods to meet market expectations and recognized standards, while maintaining and increasing the profitability and life of the business. Management and technical aspects are integrated through a practical and cost-effective approach.

The manual includes four modules on the following subjects: the use of market information for improving quality management; systems and tools for improving quality and safety management in agro-industry; the application of quality management principles in small and medium agro-industrial enterprises; planning as a tool for improving quality and safety management.

The manual contains case studies, exercises and bibliographic references, as well as a trainers' guide, PowerPoint presentations (on CD-ROM), appendices with further reading, links of interest and a glossary. The manual aims to assist trainers and entrepreneurs wishing to use the material for self-learning. With this manual, the Food and Agriculture Organization of the United Nations (FAO) provides the small and medium agro-industry sector in developing countries with an important tool for improving competitiveness and the capacity to deliver high-quality products to consumers.

Facilitators' manual

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FOR SMALL AND MEDIUM AGRO-INDUSTRIAL ENTERPRISES



Module 1: Use of market information for improving quality management



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Module 1: Use of market information for improving quality management

Technical Coordinators

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Foreword

The Rural Infrastructure and Agro-Industries Division (AGS) of FAO works to improve and strengthen the capacities of small and medium agro-industries, the enterprises that provide them with services and materials and the relevant support organizations in order to ensure food quality and safety. It carries out these activities using an approach that integrates the different factors affecting the capacity of a business to produce foods to meet the demands of the market according to recognized standards, while maintaining and increasing the profitability and viability of the business. Management and technical aspects must be integrated within a practical and cost-effective approach. This ensures that higher incomes, sources of jobs and the food security of the rural population are also promoted.

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The manual is divided into four modules, each subdivided into themes. Module 1 discusses the use of market information as a tool for business decision-making. Module 2 covers systems and tools for improving the management of food quality and safety in agro-industry. Module 3 focuses on the principles of quality

management in small and medium agro-industrial enterprises. Module 4 discusses planning as a tool for the management of food quality and safety.

This manual includes case studies, exercises and bibliographic references, as well as a trainer's guide, PowerPoint presentations, appendices, further reading and links of interest.

The purpose of this manual is to assist trainers and entrepreneurs wishing to use the material for self-learning. With this manual, FAO can now provide the small and medium agro-industry sector in developing countries with an important tool for improving its competitiveness and its capacity to deliver high-quality products to consumers.

The English version has been revised to include references, recommended reading and links suitable for English readers. In Module 2, information on standards and regulations relating to quality and safety has been included in order to provide norms that are relevant worldwide.

Geoffrey C. Mrema

Director

Rural Infrastructure and Agro-Industries Division

Acronyms and abbreviations

EU	European Union
EUR	euros
Four 'P's	product, price, place and promotion
GAP	good agricultural practices
GMP	good manufacturing practices
HACCP	hazard analysis and critical control points
SENA	Colombia's National Training Service
US\$	US dollars

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Study guide for the module

USE OF MARKET INFORMATION FOR IMPROVING QUALITY

Objectives

- To recognize the value of market information for improving the competitiveness of agro-industrial enterprises
- To identify the characteristics and the value of some basic tools for the collection, processing and analysis of market information
- To understand the steps to follow for researching markets and preparing a marketing plan

Content

Theme 1: Market information needed by the company

- The enterprise and its relationship with the market
- The importance of market information
- The market information that needs to be collected

Theme 2: How is market information collected?

- Research: collecting and processing information
- Steps in market research

Theme 3: How is market information used?

- The marketing plan
- The information flow within the enterprise

Activities

Case study: The importance of market orientation

- Exercise on Theme 1

Case study: Coordination of market demand and production capacity

- Exercise on Theme 2

Case study: The trend towards removal of the intermediary – direct exporting

- Exercise on Theme 3

Assessment

At the end of each theme, section participants carry out an exercise to assess their general understanding of the theme

INTRODUCTION

Module 1 provides agro-industrial entrepreneurs with an overview of the importance of the market for the effective functioning of all companies. Businesses in the agro-industrial sector operate in increasingly competitive markets. The proper coordination of production, logistics, processing and distribution to meet the client's specific requirements is therefore fundamental to the sustainability of the enterprise. Module 1 presents simple tools for handling market information, stressing their importance in improving the competitiveness of agro-industrial businesses.

CONTENT

The elements to be developed have been divided into three themes. These provide: (i) simple guidelines for entrepreneurs in defining the type of market information needed; (ii) tools for obtaining such information; (iii) advice on how to use it to support the decision-making process.

Theme 1: Market information needed by the company

This theme illustrates the importance of a close link between agro-industrial enterprises and the market. This link allows agro-industrial entrepreneurs to interact with a group of agents in order to obtain regular information to ensure that the right decisions are made for improving production processes, distribution, logistics, etc.

Theme 2: How is market information collected?

Market research techniques are presented in a simplified form as one of the main tools for obtaining market information on different aspects of the business. Other simple and effective techniques can be implemented easily by most agro-industrial enterprises.

Theme 3: How is market information used?

Guidelines for the development of a marketing plan are presented for planning future actions to improve positioning in the target market(s).

ESTIMATED TIME

A total of 10 hours should be sufficient, including the time required for classroom sessions, practical exercises, review of materials and any other activities proposed by the participants.

Theme 1: Market information needed by the company

INTRODUCTION

Current trends in food consumption indicate a consumer preference for natural foods that are beneficial to health and well-being. Nowadays many supermarkets stock a wide variety of products to satisfy the specific preferences and tastes of different consumer groups. This is known as ‘market segmentation’.

This raises the basic question of how companies can identify these preferences and incorporate them into real products. There is no doubt that change is driven by observing the market and adjusting output accordingly. This is essentially a decision-making process based on a shrewd interpretation of the information provided by market agents, as well as the data generated directly by the company. Enterprises constantly face new challenges: they must achieve optimum levels of quality and customer satisfaction, offer new products, support their existing products in the market and penetrate new markets. This places demands on businesses for improving levels of contact, communication and knowledge of the different actors in the chain, including suppliers, competitors and distributors.

In the past, companies produced goods and then looked for a place to sell them, whereas nowadays companies are required to produce products that people are prepared to buy. This market approach takes into account consumer desires and expectations; it also demands a degree of planning to meet consumer expectations over the long term. This basically requires constant adjustment of supply to meet changes in demand.

Agro-industries have characteristics that differentiate them from firms in other sectors. Their raw materials are usually perishable and this reduces substantially the time available for operations on a particular product. Moreover, they are mainly seasonal industries and are reliant on natural factors outside their control. Agro-industrial enterprises must therefore obtain raw materials of suitable quality and price at the right time, in adequate quantities and in an organized manner. This demands an understanding, and synchronization, of the entire supply chain.

Market globalization, developments in communications, new sales techniques and changing consumer habits have intensified competition, which can lead to a decline in established positions in a specific product market. A constant flow of market information is extremely important for all companies in order to adapt to and anticipate these changes. In many Latin American countries, small enterprises drive economic development and must be able to respond to rapid changes in the market at all times. They must therefore manage information more

efficiently to ensure that it serves as a powerful decision-making tool. Agro-industrial entrepreneurs must be proactive in gathering relevant information and designing systems for managing this information in the best way possible. In all cases entrepreneurs must determine and evaluate the usefulness, availability and cost of any information that could support their own particular decision-making process. How well an agro-industrial enterprise is able to seize opportunities and correct any problems encountered depends to a large extent on how effectively it can manage its market information. The more effective it is in obtaining and using information, the lower the risk attached to any business in the agrifood chain.

EXPECTED RESULTS

By the end of this theme, participants are expected to have a better understanding of:

- the importance of market information within agro-industrial enterprises;
- the functioning of the enterprise as an integrated system within which market information acts as a motor for continual improvement and innovation.

SUPPORT MATERIALS

Case study: The importance of market orientation

Reading for Theme 1: The links between the enterprise and the market

PowerPoint presentation: Theme 1

Exercise for Theme 1

Case study**M
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The importance of market orientation

Introduction: opportunities

The Chilean company Invertec Foods produces dried vegetables, with red peppers being one of its most important products. The company hopes to benefit from agreements reached with the European Union (EU) concerning the forthcoming reduction of tariffs. One of its managers stated: “There is much work to be done to become the preferred choice of European consumers ... we are so far away that we have to provide them with better guarantees to attract their interest.” It is important to note that production costs of local agro-industries are lower because of low-cost raw materials. “Fresh apples cost us between US\$60 and US\$70 per tonne, while in Europe they cost between EUR100 and EUR120.” This underlines the great importance of production costs because the price of the raw material represents 65 percent to 70 percent of the final cost. The manager also stressed the fact that Chilean products require almost no additives and that they are becoming progressively more “organic”. These positive factors combine well with the other major advantage of being produced during the off-season in European markets. “The other aspect is the importance Invertec places on customer service because our goal is never to lose a customer.” Companies in this sector generally need to improve this process so that all their employees are aware of the importance of links with the customer.

Development: strategies to seize market opportunities

Given that an agreement with the EU is expected soon, the company is already sending samples of its products to potential buyers to secure shipments for the coming season and to take immediate advantage of lower tariffs. “If we wait until the agreement comes into force in January and we start to produce apples only in May, a full year will be lost,” the manager warned, underlining the fact that Europeans are accustomed to closing business deals in September.

He also pointed out that the agreement will call for diversification of exports. Current exports, particularly in the case of peppers, concentrate on markets in Japan and the United States of America. “Europe is made up of many niche markets because each country is quite different from the others,” the manager added.

Europe currently buys 35 percent of Invertec Foods exports, which makes it the most important market. “We are keen to continue growing in this market and to reduce our dependence on markets such as the United States of America and Japan. Serving more markets would reduce our level of risk. The idea now is to add frozen products, juices and other dried products.”

According to the manager, the agro-industrial products with the greatest growth potential in the EU are dried vegetables, “because they are used a lot and are being imported from Turkey”. Frozen products also have huge potential, especially those used to prepare pizza. It was disappointing that frozen raspberries, dried tomatoes and mushrooms were not included in the initial list of products with a reduction in duties. “It will be seven years before any reduction applies to all the products with the highest duties,” he added, pointing out that the agro-industry could grow by at least 20 percent in the wake of the agreement.

The European markets that Invertec Foods is contacting to familiarize them with these products include Germany, France, the United Kingdom, Italy, the Netherlands and the Scandinavian countries. Contacts so far have revealed that Europeans have little awareness of the Treaty of Association signed with Chile, although they are aware that Chile is a part of the Latin American region.

Support: the importance of the environment

According to the general manager of another Chilean company, Corpora Aconcagua, the entry of **Eastern European countries into the EU will mean greater competition for Chile in the market and it will therefore have to make great efforts to position itself over the next two years to take advantage of this period and introduce the Chilean concept.** “*Chilean products must be fully recognized*”, the manager declared. He also stated that a **body was required to monitor trade agreements and that a formal procedure was needed to ensure that signed agreements are defended and respected.** He noted that the Government’s budget of US\$1 million was inadequate for assisting exporters. “*Much of this is political and requires the Government’s active participation,*” the manager affirmed.

With the Eastern European nations joining the EU, the addition of more countries would result in domestic products becoming more competitive, because subsidies would fall proportionally and the EU was not willing to increase them. The manager emphasized that, in the European Union, **agro-industry is currently taxed through duties of between 15 percent and 25 percent but that, when subsidies are included, duties rise to 40 percent.** The manager added that this year the EU had modified its subsidy policy, previously aimed at processors, which had led to anomalies, but now it was aimed at agricultural producers, resulting in less price distortion.

He suggested that the national bank should develop instruments denominated in euros. This agreement provides a major opportunity for increasing exports; in fact, by the fifth year, agro-industrial shipments from Chile will probably see an annual growth rate of 20 percent. He estimated that growth would not be very significant in the first year of operation of the trade agreement but that, as from the second year, it would increase substantially. He believed that the European countries most likely to be interested in Chilean agro-industrial products included Germany and the countries of Northern Europe. “Spain could also be a good partner.”

Source: Based on *El fuerte potencial de los productos agroindustriales en la Unión Europea*.
Revista Agroecológica No 69.

CRITERIA FOR ANALYSING THE CASE

After reading the above case study carefully, analyse the text, including the following steps:

- Identify the type of internal and external information that management uses to describe the company's situation.
- Highlight the key aspects of the relationship between Invertec Foods and its customers.
- Evaluate how important market information has been for the company as a supplement to internal information.
- Identify the company's weaknesses in terms of its knowledge of the quality and safety requirements for the importation of fruit and vegetables into European Union markets.

The same tasks are listed at the end of Theme 1 so that they can be completed on the basis of newly acquired knowledge.

Reading for Theme 1**The links between the enterprise and the market****THE ENTERPRISE AND ITS RELATIONSHIP WITH THE MARKET**

To improve our understanding of how the market influences the enterprise and vice versa, as well as how they are interconnected, we need to clarify some key concepts relating to the market, to the enterprise and to marketing itself.

Market

A market is a group of buyers and sellers willing and able to carry out transactions. The market is defined by consumer demand (what consumers want, how, when, where and at what price), including final or intermediate customers who demand quality control, packaging and logistics, price negotiation and forms of payment.

Competing enterprises have a major influence on decisions concerning prices, forms of distribution, promotion policy, etc.

The market also includes the government, industry groups and unions. The government is very important as it can regulate aspects of product quality and safety, requirements for the installation of equipment and policy on duties, taxes and quotas, as well as other issues that may affect end results.

Finally, it is important to define the market environment in order to analyse its different components: local, regional and international.

Market segmentation

There is a simple premise underpinning the theory of consumer behaviour: buyers – current and potential – are not all the same. Each customer buys according to different needs, desires, interests, preconceptions, experience and other personal parameters. Nevertheless, in a group of current or potential customers it is possible to identify subgroups of people, companies or customers that behave in a similar manner and demand products and services of the same type.

To segment the market means to divide it into subgroups of homogeneous buyers. The criteria for segmentation can be demographic (age, sex, residential location), psychographic (activities, interests, opinions, personality, lifestyle) or socio-economic (income, standard of living). When a specific segment is identified as not being served, this is known as a ‘market niche’.

Marketing

Marketing covers a set of activities directed at satisfying the wishes and needs of customers through trading, thereby generating profits.

The marketing process involves a series of activities based on knowledge about customers, suppliers, product quality, safety requirements, prices, etc. These activities interact in every direction:

- with the source (suppliers);
- with the destination (distribution and the final customer);
- all around (with the political, social, cultural and ecological environment).

The marketing mix

This is a set of controllable marketing variables that govern the decisions taken by the company to achieve its objectives in the target market. The major variables that can influence demand for the product are often referred to as the ‘four Ps’ (product, price, place [or distribution] and promotion). These four variables allow different combinations of strategies to be implemented for each product or group of products, market segment, etc.

Enterprise

An enterprise is an economic and social unit that functions as a system of parts that interact in a coordinated manner to offer goods and services that satisfy needs. The system comprises a group of processes that operate in different areas of the enterprise. These processes govern the consumer products and services that are put on the market in accordance with the quality, quantity, price and opportunity that the market requires. The enterprise must be in constant contact with agents in this environment. The flow of information and agro-industrial products therefore travels in two directions: from the enterprise to the market and from the market to the enterprise.

The specific demands of globalized markets oblige agro-industrial enterprises to prepare internally to receive and process valuable information coming from the market. This allows them to respond quickly and precisely in order to seize opportunities and overcome any constraints. The enormous costs involved in taking wrong decisions mean that well-informed decisions must not be based solely on instinct or common sense. Decisions must also be guided by market knowledge or, more specifically, market information.

Agro-industrial enterprises usually produce goods, so entrepreneurs also have to consider what to produce, for whom, when, and using which resources.

The enterprise and its processes

The following processes can be identified within an enterprise:

- marketing
- financial
- accounting
- production
- human resources

All of these processes are closely interconnected inasmuch as the failure of any one of them affects the functioning of the system as a whole. Although each process deals with specific requirements, at the same time it contributes to the proper functioning of the others. Given that all the areas and processes are important, it is essential for an agro-industrial enterprise to continue to manage

its processes, while giving due weight to marketing aspects as the starting point for planning its actions. As market information is fundamental to improving the competitiveness of an agro-industrial enterprise, it is imperative to strengthen processes by improving contacts with the market.

An important part of the data and information required in a market information system comes from the enterprise itself or is obtained from its environment. Each area generates valuable data that should be taken into account in decision-making. For example, the financial process analyses and evaluates the fulfilment of payments and the payment terms for different clients. The production process generates information on the quality, accessibility and seasonality of raw materials. The human resources process extracts information on wastage from the preparation of each product. The sales sector receives information on what is happening outside the company. The important point is that all the data and information generated within or received by a company can be analysed and made available at the right moment.

THE AGRIFOOD CHAIN AND VALUE ADDED

Every food in the fruit and vegetable sector has a history or a path it has followed; value is added to the product at each step until it arrives in the hands of the consumer. This agrifood chain comprises people, enterprises and institutions dealing with production, processing, marketing, transport, storage, consumption and other related activities. An understanding of the processes in the chain and their synchronization is key to achieving success in any enterprise.

The main links in this chain are:

- primary production
- post-harvest handling
- manufacturing or processing
- transport
- distribution
- marketing
- consumption

Each link in the food chain delivers a product with added value for the following link. There is synergy in the process because the contribution of each agent affects the results of the subsequent stages and the ultimate quality of the product. Quality is understood to relate to the level of satisfaction of the agents involved in each successive step in the process, until the product reaches the final consumer.

The demand for differentiated products

One of the major characteristics of market trends for fruit and vegetable products is the demand for products with quality and safety guarantees and with certification of quality management, fair trade or social responsibility.

In general terms, **quality can be defined as the product properties and characteristics that satisfy the consumer's explicit and implicit demands.** In the case of agro-industrial products, consumer demands have been evolving in recent decades, incorporating the characteristics known as 'product attributes'. These

include **physical characteristics such as** size, colour, shape, freshness and freedom from damage, as well as flavour and smell (organoleptic qualities), nutritional value and others that are beneficial to health. In addition, there are ‘process attributes’ which relate to production and processing practices and their impact on the environment, human health, animal and plant health and the welfare of employees.

Other quality aspects include the product’s shelf-life and the ethical responsibility of the actors in terms of human resources and environmental management. The concept of quality also covers the ability of a company to satisfy the explicit and implicit demands of its customers.

In all cases, quality is referred to as the attributes that behave dynamically and change in response to the changing tastes and preferences of customers and consumers.

Demand for quality and safety guarantees

Consumers are able to judge directly only some of a product’s characteristics, such as flavour, aroma and appearance. Labels, brands, seals and certification provide additional information on quality aspects that the customer or consumer is unable to assess directly. Regulatory institutions monitor these aspects, which include nutritional levels, safety and processes, as well as social responsibility in the management of human resources and the environment.

The demand for guarantees relating to characteristics that consumers cannot assess directly and the need to guarantee food safety and public health have given rise to growing demand for certification. Examples include certificates granted by governments that products meet sanitary and phytosanitary requirements, or by private entities to certify processes. Other guarantees are implemented by companies as part of their quality management activities, including good agricultural practices (GAP), good manufacturing practices (GMP), hazard analysis and critical control points (HACCP), labour standards, organic and fair-trade production systems and corporate social responsibility.

Demand for products differentiated by value added

Consumers find it very attractive when value added facilitates the purchase and consumption of products. This is especially so for packaging and specific formats, labelling and extending the shelf-life of the product. Technological innovation is therefore key to improving the company’s competitiveness and long-term sustainability.

Companies do not always require complex research systems to obtain timely and relevant information. Below are some of the activities that small-scale agro-industries can carry out to strengthen the marketing process:

- participating in events, such as symposia and conferences on market trends, new demands from buyers or similar topics;
- organizing a small team to search constantly for relevant information (the internet is a good source of information, as are subscriptions to relevant publications);

- creating a simple system for recording information in databases to make the information easier to consult;
- networking with potential clients and other entrepreneurs by participating in associations and industry groups, as well as through contacts with institutions organizing trade fairs and business round tables.

MAIN ACTORS IN THE CHAIN

Actors in the market can be divided into four groups: **consumers** and customers, **suppliers** (of products and services), **competitors** and **regulators**.

Consumers and customers

This group comprises users and consumers who are the final beneficiaries of the agro-industrial enterprise's products and services. The enterprise generally makes contact with customers or economic intermediaries who not only transmit consumers' concerns, tastes and preferences, but also identify trends and act as generators of new consumption habits.

Suppliers

Suppliers are a group of agents that provide the agro-industry with raw materials, technology and services, such as transport, freight, financing and storage, port services, auditing, quality certification, market research and studies. There is a wide diversity of suppliers, catering to the needs of all the company's areas and activities. Their participation and commitment are important elements in the company's quality management.

Competitors

This group comprises all the agro-industrial enterprises that compete in the world market or at the local, regional or national level, depending on the company and the products it handles. Competitors' actions can bring about (sometimes quite sudden) market changes, in terms of prices, distribution or changes to the promotion model. Understanding the competition is just as important as understanding consumers.

Regulators

This group comprises public and private bodies whose common purpose includes protecting consumer health by ensuring the safety and quality of foods, protecting the life and health of animals and plants and monitoring the application of good business practices.

THE IMPORTANCE OF MARKET INFORMATION

Market information is an invaluable resource for decision-making in agro-industrial enterprises, enabling the company to influence and expand in the market, thereby improving its competitive position.

Why is it necessary to know the market?

Knowledge of the market is required in order to: identify opportunities; increase confidence in the product being sold; determine quantities, locations and forms of distribution; identify current and potential problems and understand the competition.

Every day entrepreneurs must make decisions concerning the purchase of supplies, staff recruitment and investment. Over the longer term, they make decisions regarding the development of new products, the expansion of distribution channels and conducting market research or promotional campaigns. Entrepreneurs also make decisions concerning which products to produce or sell, their quality, and which market segments to target.

In order to meet planned objectives, market information must be:

- in a suitable format for ease of interpretation;
- timely;
- available at the right place;
- cost-effective for the company.

Subsequently, when exploiting the information, entrepreneurs must organize activities to achieve the planned objectives and then develop and implement the range of strategies and changes established during the planning process. This is not a static process; there is a permanent flow of market information that triggers activities as part of an integrated and continual improvement approach, which accompanies strategies and actions within the agro-industrial enterprise.

WHAT TYPE OF INFORMATION SHOULD BE COLLECTED IN THE MARKET?

Each company should have: (i) a clear understanding of the demands of its customers and consumers; (ii) information on the suppliers of its raw materials and services; (iii) data and information on competitors; (iv) relevant data on standards and the regulatory environment. All the above affect the production and marketing of its products.

How can this information be accessed?

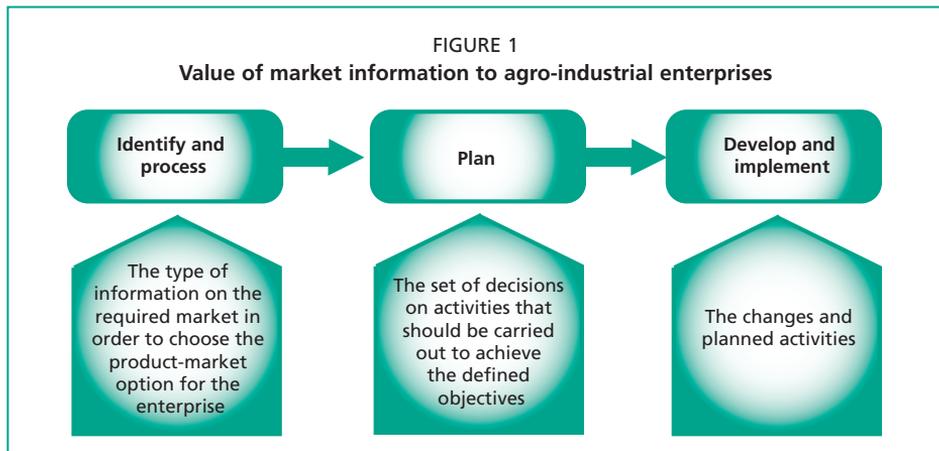
It can be accessed by means of:

- market intelligence;
- market research;
- internal data and information within the company.

Information from various sources is used as a tool for quality management in the company, planning and developing strategies for improving existing products, developing new products and analysing clients, distribution patterns, etc.

Figure 1 gives an example of how market information can be used as a decision-making tool in an agro-industrial enterprise, considering the four main actors in the market:

- consumers or customers
- suppliers



- competitors
- legal and regulatory bodies

Even though the search for market information is linked directly with the company's objectives, the entrepreneur should keep abreast of trends in demand relating to:

- the consumption of and preference for healthy foods, including functional foods (foods that add nutritional value to the diet and have a positive impact on health, illness prevention, etc.);
- the consumption of fruits and vegetables (fresh, processed, organic, fair-trade, etc.);
- the presentation of the product (packaging units, types of packaging and materials used, as well as the opportunities for product differentiation through value added);
- voluntary and compulsory standards and regulations in force in the target market(s).

According to McGillivray (1998), an entrepreneur in a small or medium enterprise should have sufficient information to answer the following questions:

- a. For **which products**, varieties and presentations are there buyers?
- b. **Who** are the buyers?
- c. **What** prices are they willing to pay?
- d. **What** are the **conditions of payment**?
- e. **What** are the buyers' demands?
- f. **What** quantities do they wish to buy?
- g. **Where** will the buyers purchase the products and what type of transport is required?
- h. **When** do the buyers require the products?
- i. **What competition** will have to be faced?
- j. **What** are the relevant government **regulations and standards**?
- k. **What** measures are being planned to **reduce the risks** associated with the sale?

TABLE 1
Applicability of market information

Applicability of market information	Information on demand	Information on suppliers	Information on the competition	Information on regulations and standards
	<ul style="list-style-type: none"> • Unmet needs or business opportunities • Market segments needing attention, consumers whose needs are not adequately met • Profitable market niches • General and specific characteristics of products that are suited to the needs of the market segments and the identified and selected niches, especially those linked with quality and safety • The size of the market 	<ul style="list-style-type: none"> • Raw material suppliers • Reliable suppliers of materials of consistent quality • Seasonality of supplies of goods and services, which helps to improve planning and decision-making to enter a specific market • Conditions of operation (volume/opportunity/cost) • Suppliers of inputs and critical services • Packaging • Additives and preservatives • Transportation • Storage 	<ul style="list-style-type: none"> • Companies that are or could become competitors for the product(s) in question • Enterprises in a dominant position and the trends in concentration and control of the market • Strengths and weaknesses of competing companies, key to establishing competitive strategies and exploiting the weaknesses of the competition • Levels of quality, positioning and development of markets and the strategies applied in these areas • Marketing strategies used by the competition, taking into account the four Ps (product, price, place and promotion) • How committed competitors are to achieving protocols on product quality and safety 	<ul style="list-style-type: none"> • Legal framework that regulates national and international trade in the products being studied • Voluntary standards that apply in the market for current and potential customers, such as protocols for quality and safety certification • Requirements for market access, such as phytosanitary regulations, duties, traceability, safety, maximum residue limits and accepted products • Promotion policies or preferential agreements relating to markets that provide advantages for our company or our competitors • Government policies on consumer protection • Agencies for certification of private protocols
Identify				
Plan	<ul style="list-style-type: none"> • Confirm or redefine your objectives, particularly those relating to quality and safety, based on the supply of raw materials and their seasonality, quality and safety attributes • Redefine your strategies and goals and the action plans for achieving them • Decide on changes in the production of raw materials: varieties, technology, estimated production volume 	<ul style="list-style-type: none"> • Define criteria for the selection of suppliers on the basis of their objectives, goals and action plans 	<ul style="list-style-type: none"> • Define general market strategies and your specific strategy on positioning 	<ul style="list-style-type: none"> • Identify and strengthen the criteria for the selection of target markets on the basis of their objectives, strategies, goals and action plans
Develop	<ul style="list-style-type: none"> • The appropriate product to satisfy the identified needs • The variety of products for each segment that has been selected 	<ul style="list-style-type: none"> • Knowledge of and relationships with key suppliers • Strategic alliances with suppliers of inputs and services 	<ul style="list-style-type: none"> • Strategic alliances with alternative producers, which enhance competitiveness 	<ul style="list-style-type: none"> • Policies on quality and sectoral or trade-association proposals with specific targets on country-based positioning of products • Alliances with customers for the implementation of sales campaigns

Exercise**COMPLETING THE CASE STUDY**

After reviewing the content of this theme and comparing it with your own experience, review your responses to the tasks listed initially and try to correct or supplement them. Link your replies to the topics that have been covered in this section.

APPLYING THE EXERCISE

In order to encourage the practical application of the knowledge acquired in Theme 1, complete the following tasks with specific reference to your own business:

- Make a matrix of information sources that your company uses for making decisions, including both internal and external sources; take into account the four Ps (product, price, place and promotion).
- Describe two practical applications of market information that would improve your company's competitiveness.
- Consider consumer trends for your company's products and design appropriate market segmentation, then come to a conclusion regarding the implications of these trends for the environment of your business with respect to the four Ps.

Assessment of the theme

Complete the following tasks, using additional pages as required.

- 1. Indicate why it is necessary and important for agro-industrial enterprises to have market information.

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- 2. Identify and highlight some trends that affect your business activity, or would benefit it.

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- 3. In the specific case of your company, and bearing in mind that an enterprise is a system, what are the sources of (and the ways to access) internal information in your company? How is it used in decision-making? What external sources of information do you currently use? Assess the criteria you would use to analyse the feasibility, quality and cost of gathering such information on your products.

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Summary

- The demands of a globalized market oblige agro-industrial enterprises to prepare internally to receive and process valuable information from the market to enable them to respond rapidly and appropriately to seize opportunities and resolve any problems.
- Market information provides invaluable support for the decision-making process, enabling the company to outperform the market and improve its competitive position. As a first step, entrepreneurs should clarify the type of information needed and process it in such a way that it can be used to define concrete objectives: this is known as ‘market intelligence’.
- In general terms, the company should have a clear knowledge of the demands of its customers or consumers, as well as information on the suppliers of its raw materials and services, on the competition and on the standards and regulatory environment that impact the production and marketing of its product(s).
- In the case of fruit and vegetable products, market trends are oriented towards products with quality and safety guarantees and towards product differentiation through value-added certification.

Theme 2: How is market information collected?

INTRODUCTION

As mentioned in Theme 1, information is essential for entrepreneurs who realize that market orientation is the only approach that ensures that their products meet the requirements of current and future demand.

The entrepreneur's task is to define the best ways of collecting such information. There is a considerable amount of information in the company environment that could be used for establishing objectives, goals and markets. In many cases all that exists is a mass of data, which has to be converted into information. Companies should strive to obtain market information in a planned and organized manner to ensure that its cost and value are reasonable.

Information used in decision-making can come from inside the company (costs, sales prices per customer, customer complaints, surplus of unsold products, lack of installed capacity to meet demand, personnel unlikely to satisfy customer quality and safety requirements, etc.). Other information from the enterprise's environment can be obtained from employees, the press or public or private information systems, or else by what is known as "market research".

Market research is a way of integrating the product with demand and demand with the product. The research process comprises a series of steps, from defining the research to final analysis of the data obtained. It may consist of simply conversing with current and potential clients or with consumers of the product; at more sophisticated levels it may also include surveys, taste tests and structured interviews.

Each enterprise can form its own market information system that includes information from secondary sources (the press, consultants, public or private information services for the entrepreneur or for the consumer), information generated inside the enterprise and market research.

EXPECTED RESULTS

By the end of this theme, participants should be able to:

- understand the meaning of market information, its different sources and its usefulness as a tool for decision-making in the company;
- identify the characteristics and usefulness of some basic tools for the collection and processing of market information;
- understand the sequence that should be followed to carry out market research.

SUPPORT MATERIALS

Case study: Coordination of market demand and production capacity

Reading for Theme 2: Market research

PowerPoint presentation: Theme 2

Exercise for Theme 2

Case study**M
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Coordination of market demand and production capacity

Presentation: the situation

In the province of Chepen on the northern coast of Peru there are large tracts of land that have been used for crop production but have not been profitable or managed optimally. A few years ago a company was established in the area for the production of 'minimally processed products', mainly avocado and plantain. Later, having identified opportunities in overseas markets, the company began processing paprika.

This new venture was apparently profitable to the processing company as well as to local farmers in terms of market prices (US\$2.42 per kg) and yields per hectare (4 tonnes). The suppliers were located close to the plant.

The company initiated contacts with producers interested in paprika production. The results obtained after the first harvests were well below the company's expectations. The average yield in the best of cases was 1.0–1.2 tonnes per hectare, and the product quality did not meet the specifications of buyers in international markets. The only market price that could be obtained (US\$1.40 per kg) was little more than half the anticipated price.

After this experience, the processing company sought support from specialists at a technical institution with experience of managing markets in order to review the problems encountered and to make recommendations on how to overcome them.

Development: the identification of failures in obtaining reliable market information to support the decision-making process

The comments of the consulting company took into account the fact that there was insufficient information on the market that the agro-industrial enterprise had planned to serve. Poor or missing data could be summarized as follows:

- The data on quality requirements demanded by the buyers, i.e. sizes, defects, presentation, **were insufficient**.
- The expected yields per unit of land were below the minimum amounts for feasibility; at least 20 tonnes per hectare would be needed to make a profit. Moreover, the fact that average yields of only 4 tonnes per hectare were harvested in the second year had not been taken into account.
- The agro-industrial enterprise and producers were unaware that plant disease and pest management would affect yields and quality levels.

- There was a lack of awareness of the production and processing practices necessary to maintain product quality and reduce the percentage of post-harvest losses.
- There was a lack of awareness of fluctuations in prices according to supply and demand.

Outcome: possible solutions

An analysis of the situation makes it possible to identify the major problems and to conclude that this type of crop might be an interesting business opportunity if sufficient information could be obtained. The following actions were suggested:

- Obtain information regarding the quality requirements for the markets and customers to be served.
- Stay informed and aware of the experiences of other processing companies operating in this field.
- Promote the technical improvements required to increase the crop's productivity.
- Control post-harvest losses during product handling and processing by means of staff training and the use of appropriate equipment in order to maintain product quality.
- Plan seed sowing to take into account the expected yields and customer demand.

Improving the technical qualities of crops would increase and improve the agro-industrial enterprise's production, enabling it to manage the availability and quality of its products for the market.

Source: Authors, based on experience of the Delcampo company, Peru, 2005

CRITERIA FOR ANALYSING THE CASE

After reading the above case study carefully, analyse the text and answer the following questions:

- What do you consider to be the starting point for initiating or changing a business activity?
- Why is appropriate and reliable information such a determining factor for the success or failure of an agro-industrial business activity?
- Which gaps in market information concerning production and processing of the product are identified in the case study?
- Which lessons were learned from the experience described in this case?

The same questions are posed at the end of Theme 2 so that they can be answered based on the newly acquired knowledge.

Reading for Theme 2**M
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Market information

No company can operate in isolation from the market environment. Enterprises that are able to obtain and manage relevant information will be more likely to beat their competitors by producing better and more competitive products and meeting the requirements of target markets.

According to Alvin Toffler, the problem of the twenty-first century is not access to information but the capacity to process and use it efficiently. Generating information requires human and economic resources. The company must have clear objectives and priorities to avoid being inundated by data. Therefore, information must: (i) reach the company in a format that can be interpreted; (ii) be available on time; (iii) reach the staff responsible for taking decisions; (iv) have a reasonable cost. Enterprises can use market information to:

- reduce risks associated with marketing;
- identify where to sell;
- verify current prices;
- decide on whether to sell a product immediately or to store it;
- determine changes in the cycle of production, varieties cultivated, qualities of the products, etc.

Therefore, it is useful to implement what is known as a market information system, which includes:

- information generated by the enterprise itself (production, costs, sales by type of client, attention to customer complaints, reliability of suppliers, etc.);
- 'intelligence' data and information on the company's business environment (economic trends, behaviour of competitors, strengths and weaknesses of competitors and of the enterprise itself);
- data collected by market research.

WHAT IS MARKET RESEARCH?

Market research is a part of the overall information that the company can obtain from its market information system.

Market research is defined as the collection, recording and systematic and objective analysis of data relating to problems and opportunities in markets for goods and services.

It is a systematic process because the research project must be well organized and planned. Objectivity refers to the efforts and professionalism of specialists who perform their task impartially.

The strategic aim of market research is to improve knowledge of the system by providing information that reduces the degree of uncertainty and bridges gaps in market knowledge. The main objective is to generate information on concrete problems in order to improve the management's decision-making. In small-scale enterprises market research is often improvised and is little more than a trial and error approach that produces generalized data. In this case a company simply launches a product for sale but over time it will be forced to make the necessary adjustments.

WHY USE MARKET RESEARCH?

Market research is a powerful tool that allows a company to obtain information directly from the market.

Research is a tool accessible to all types of enterprise. However, many small-scale enterprises perceive market research as being very expensive and therefore impossible for them to undertake. This is not true because a great deal of market research can be carried out with minimal resources, depending on the type of product and the depth of the research.

While market research is an important aspect in the planning of an agro-industrial enterprise, it should be recognized that this type of research is an inexact science. It is impossible to predict the future precisely and, in many cases, the marketing difficulties encountered by entrepreneurs depend on external factors beyond their control.

For an agro-industrial enterprise, market research can contribute to:

- decision-making by providing information needed for making immediate and long-term decisions;
- improving the company's management capacity;
- providing management with valid information concerning the potential sales of a product, the factors that can influence these sales and the best way to market the product;
- improving the company's profitability.

Basically, market research contributes to increasing profits through such improvements as:

- adapting products to demand;
- perfecting promotion methods;
- defining prices in relation to quality requirements;
- constantly evaluating proposed objectives and strategies for achieving basic goals;
- defining a promotion campaign;
- adapting logistics to requirements.

Table 2 presents a list of the topics that can be studied using market research.

TABLE 2

Guide for determining what market information is needed to develop my products

Variable in the marketing mix that should be studied	What to research?
Product	<p>How much can be sold, when and where?</p> <p>Recognize and consider the importance of major buyers, wholesalers, and retailers.</p> <p>Determine current offers and the different market segments.</p> <p>Evaluate the supply according to source: national, imported.</p> <p>Learn about the seasonality of demand and current supply.</p> <p>Which type of transport is used by the competition, and what do buyers want?</p> <p>Which services do competitors provide, e.g. just-in-time delivery, stock control?</p> <p>Are there reliable transport services in my area for my products, and what are the costs?</p> <p>What are the quality and safety requirements for customers/consumers?</p> <p>Is there a reliable cold chain to preserve the quality and safety of the product?</p> <p>Quality and safety specifications for products by segment and by type of customer</p> <p>How can I make my product more attractive in terms of presentation, package size and characteristics, price, etc.?</p> <p>Is a brand an attribute that the consumer is willing to pay for?</p> <p>How are competing products protected from fraud, contamination by dirt or physical damage?</p>
Price	<p>Analyse competitors' prices.</p> <p>Analyse prices of similar products that could compete with your company's products.</p> <p>Analyse different packaging, presentations and logistics for competing products.</p> <p>Analyse the criteria for establishing prices for the different customers, terms of payment, handling of product rejects at the point of sale.</p> <p>Elasticity of supply and demand.</p> <p>Seasonality of prices and the sales cycle.</p>
Place (distribution)	<p>Analyse various marketing channels and forms of distribution (direct to consumers, retailers, wholesalers, importer-distributors, institutional buyers).</p> <p>Determine minimum and maximum quantities of the product that distributors are willing to handle.</p> <p>Analyse margins, surcharges and forms of payment.</p>
Promotion (and advertising)	<p>Determine the type of promotion expected or needed by current and potential customers (advertising, point-of-sale demonstrations).</p> <p>Which promotion or advertising is carried out by the competition?</p> <p>Which types of promotion agreements are common among competitors and the customers or distributors?</p> <p>Which type of advertising is being used (posters, flyers, point-of-sale demonstrations, special offer pricing, tasting)?</p> <p>Which messages are being used to promote competitors' products?</p>

TYPES OF MARKET RESEARCH

There are several types of market research, depending on the area of study, the information collected, the time allotted and the degree of accuracy required.

Exploratory research means gathering preliminary information as a basis for defining the problem and establishing a hypothesis to be tested.

Descriptive research means that the results obtained describe elements or aspects of a product within a specific market.

Classification is also possible according to the elements of the **marketing mix**: products, prices, distributions, promotions or consumer behaviour.

Finally, the **procedures** used to collect the primary data are: observation, survey and experiment. Contacts may be made by mail, in person, through the internet, etc.

STEPS IN MARKET RESEARCH

The process of market research involves a series of phases that are summarized in Table 3. If the research is not carried out in a structured way, with very clear objectives and precise limits on what is to be collected, the final result could be simply a mass of data and erroneous information.

TABLE 3
Steps in market research

(a)	Definition of the problem or need for information	The items to be researched are defined in order to focus efforts and resources on topics or situations of relevance to the company.
(b)	Objectives of the research	The goals of the research are defined. Objectives and precise targets enable the company and the researchers to focus on the steps to follow during the research process.
(c)	Identification and analysis of the sources of information	Sources of information and the necessary data are reviewed and selected to optimize the allocation of resources during the market research.
(d)	Preparation of instruments and methods according to requirements	The instruments and methods to be employed are prepared in order to proceed to the information collection stage.
(e)	Definition of the sample	Calculations are made of the total number of people to be consulted in the study, where they are located, etc.
(f)	Fieldwork	The data collection process is carried out.
(g)	Processing of information	The information is organized, coded and tabulated for processing.
(h)	Analysis of information	The information collected is analysed and evaluated. This is one of the most important steps because: (i) the results of the process are compared with the objectives established and (ii) the methodology is assessed taking into account the information still required to achieve the objectives of the study.
(i)	Final report	A report is prepared that includes the formal conclusions of the study, a presentation of the company results and recommendations for decision-making by the company's senior management.

Definition of the problem or need for information

Research is undertaken where there is a need for better information on a specific situation or because a problem has become evident. The reason why information is needed must be clarified. The person who will be in charge of this task should ask the following questions (for example):

- What precisely is the market research expected to achieve?
- Is it to solve a problem or to identify a solution?

Market research is frequently undertaken in particular circumstances where there is a need to:

- obtain further details about the subject of the study (e.g. to find out more about the buying habits of consumers in a new market);
- forecast and, where possible, anticipate changes in the market (e.g. discover the implications of new tax measures on product offerings);
- monitor the effectiveness of the company's actions (e.g. ascertain the degree of satisfaction of a group of consumers concerning the product, packaging or price);
- identify problems relating to a particular market variable: price, product, place or promotion (e.g. comparing competitors' prices with those of your company).

A basic knowledge of the company and a review of previous studies are of great value in defining the underlying problems and opportunities. These studies are likely to provide sufficient elements for further identification and understanding of past and current problems to speed progress to subsequent phases of the process.

Several tools for defining and prioritizing problems are described in Module 3 of this manual, in particular brainstorming and multivoting.

Example

Rico's is a company that produces sauces and pastes and would like to introduce one of its star products (vinaigrette dressing), into a new market. Although this market is known to be very similar to the current market, the company does not wish to rely on intuition and limited information. It must therefore obtain more information in order to reduce the risk associated with entering this market.

Determining objectives

Market research has to be designed in the light of the objectives set by the company. Moreover, there must be adequate financial, technical and human resources available to carry out the research. Market research can be an expensive activity, especially in terms of time. Therefore it must be designed and streamlined on the basis of well-defined objectives to ensure that costs and duration can be foreseen clearly. The objectives of market research answer the question: Why is this study being carried out?

Example

If Rico's states its problem as 'insufficient information before launching the star product in a new market', then its objectives could be defined as follows:

- investigate the frequency of consumption of the type of product to be introduced;
- analyse the general characteristics of the potential group of consumers;
- identify the principal points of purchase of potential consumers.

Identification and analysis of information sources

The tasks to be carried out prior to any research project focus on identifying appropriate sources of information to be analysed and on collecting the information concerning the problem to be studied. This forms part of the 'market exploration' described in Table 4.

When data and information sources already exist, the information they generate is considered to be from **secondary sources**. When there is no information prior to the study, the information must be developed; this is known as information from **primary sources**.

It is important to evaluate secondary sources with respect to the following factors:

- origin of the source;
- degree of reliability;
- level of obsolescence;
- validity;
- utility for the purpose.

The company generally uses primary and secondary sources and seeks information inside and outside the company in order to be well informed before initiating the field research.

The information to be collected can be either **qualitative** or **quantitative**.

Quantitative information deals with observable facts (what, how much, where, when, how) in magnitudes that can be measured objectively. Quantitative information can be said to measure the visible part of whatever is being studied.

Example

A quantitative research study is designed to identify customer preferences for specific products.

The result could be: Product B is preferred by 66 percent of the participants, while the remaining 34 percent prefer Product A. Therefore, Product B is twice as popular as Product A. For example: 'Do you prefer cherry tomatoes or Roma tomatoes?'

TABLE 4
Sources of market information

Information from secondary sources	
<p>External</p> <p>Generally found in publications such as newspapers, reference works, books, statistics, official panels, economic reports, journals and magazines</p>	<p>Generating source</p> <p>These sources are available to the public in libraries and information centres or on the internet (using search engines)</p> <p>Search</p> <p>International organizations:</p> <ul style="list-style-type: none"> • Food and Agriculture Organization of the United Nations (FAO) • Organization of American States (OAS) • International Trade Centre (ITC) • World Trade Organization (WTO) • World Bank (WB) • Inter-American Development Bank (IADB) <p>Ministries or equivalent bodies: agriculture, industry, planning, overseas trade, central bank, etc.</p> <p>Chambers of agriculture</p> <p>Chambers of industry</p> <p>Chambers of commerce</p> <p>Exporters' associations</p> <p>Embassies (trade offices)</p> <p>Projects run by the private sector or by international donors</p> <p>Specialized publications produced by retail groups (supermarket chains) or companies specialized in market research</p>
<p>Internal</p> <p>Generally found in reports of accounts, trade, invoices, buying orders and inventories, as well as reports generated within the company through its operations, formal and informal customer complaints, assessment of suppliers, production statistics by type of customer, levels of rejects and the causes, etc.</p>	<p>Generating Source</p> <p>The company itself</p> <p>Search</p> <p>The company's files</p>
<p>Information from primary sources</p> <p>Characteristics</p> <p>Can be adapted easily to the company's needs</p> <p>Has the great advantage that the information obtained is direct/ and refers specifically to what is being studied</p> <p>Is more detailed than secondary sources</p>	<p>Generating Source</p> <p>The researcher</p> <p>Search</p> <p>A range of methods is used to obtain this information, including observation, interviews and different types of survey, which can be carried out by various means such as mail or electronic mail</p>

Qualitative information deals with latent facts that are not directly observable: opinions, thoughts, feelings, attitudes and motivations. Most surveys are used to highlight opinions or motivations containing a degree of subjectivity.

Example

A qualitative research study is designed to identify the preferences of customers for specific products.

The result could be: Product B is preferred over Product A because of its good flavour and its convenient packaging, etc. For example: Do you prefer Cayena Lisa pineapple or *La Española*?

Preparation of instruments and methods

The materials for conducting the research must be prepared as follows: development of the questionnaire; selection of the type of questions and the model for collecting responses; sequencing.

The type of personnel needed to carry out the study is identified. The best-known qualitative techniques are focus groups and in-depth interviews.

In qualitative research – which aims to identify reasons, motives, thoughts, beliefs and opinions relating to a topic – more than one technique can be used. The instrument most commonly used for collecting qualitative information is the questionnaire¹.

Definition of the sample

Whatever the interview technique used (telephone surveys, internet or face-to-face), it always attempts to study the total population by taking a small sample. A sample is a segment of the population considered as representative of the whole. This is of vital importance because the results cannot be extrapolated to the entire population if the sample is not ‘representative of the totality’.

Fieldwork

This refers to the physical collection of information and should be carried out in a series of simple steps:

- *Planning the fieldwork*

In this phase, preparations are made for all the steps to be carried out in the field, such as ensuring that an appropriate number of questionnaires and support materials are available. Interviewers and other team members are also identified during this phase.

¹ A deeper understanding of questionnaire design is provided by the publication *Market research for agroprocessors*. FAO, 2003. pp. 39–45 (also available at <http://www.fao.org/docrep/007/y4532e/y4532e00.htm>)

- **Preparing the interviewers**

Given that the interviewers greatly influence the study, it is important that they have at least a minimum of preparation. Whether the interviews are carried out by company employees or by people contracted specifically for the task, it is best to have a preliminary trial to be sure that the questionnaire is well designed and that the interviewers understand how to use it.

- **Carrying out fieldwork**

The main field exercise is completed when the required information from the selected sample of respondents is obtained.

- **Quality control and assessment of the information obtained**

This step is necessary in order to verify that:

- i. the questionnaires have been completed in full;
- ii. all information has been obtained correctly;
- iii. there is coherence between the responses registered by the interviewers;
- iv. the people chosen in the sample have actually taken part in the survey.

Processing the information

The information analysis process must be well prepared beforehand. This is normally done in three sequential stages: coding, tabulation and the construction of tables and graphs. Appendix 3 provides guidelines for the implementation of these three stages.

Analysis of the information

Analysis of the information involves developing an understanding of what is represented by the tables and figures in relation to the objectives originally established for the market research. In the analysis stage we need to try to understand the reasons for the specific behaviour of a variable (e.g. price variations or customer tastes, such as a preference for margarine or butter) and to establish relationships and dependencies between the variables.

Final report

The results of the market research are presented to the people in the company responsible for decision-making. It is therefore important for the people in charge of the study to take great care when presenting these results. They should always be submitted in writing, even when it is only a small study. Presenting the results in an organized way makes it easier to evaluate the findings.

The report must present clearly the principal problems that were studied, as well as the assumptions on which the research was based. Similarly, a clear description of the methodology used should be included, as well as the sources of information, how the sample was defined, the type of questionnaire and the number of people that participated. Preferably the results should be presented in tables and graphs to make it easy to assess the links between the variables studied. Finally, the report should include conclusions, recommendations and points for follow-up, based on the results obtained.

Example of the analysis of quantitative information

The following table presents the consolidated results of a survey to determine opinions regarding a particular issue 'X' according to the gender of respondents.

What can be observed in the table?

Gender Opinion	Female %	Male %	TOTAL %
In favour	53	52	53
Against	46	30	38
No response	1	18	9
Total interviewed	830	822	1 652

The dependent variable is taken as a group, and the following is observed:

- The majority of those interviewed are in favour of X, although there is a significant percentage against. However, the proportion of favourable responses exceeds half the total.

If the analysis focuses on opinions in favour according to gender (independent variable), the following is observed:

- The percentage of men giving a favourable response (52 percent) is similar to that for women (53 percent).
- A larger percentage of women give an unfavourable response. This is because there are more men in the sample who gave no response, perhaps because they had no opinion on the issue.
- Taking women as a group, the majority can be said to be in favour, although the percentage against (46 percent) is not much less than the percentage in favour (53 percent).
- On the other hand, even though the percentage of men giving a positive response is similar to that of women, the percentage of men against is much lower because a larger proportion of men gave no response.

Exercise

COMPLETING THE CASE STUDY

Review the responses to the questions set initially and try to clarify or supplement them, linking your answers to the topics that have been covered in this section.

APPLYING THE EXERCISE

In order to encourage the practical application of the knowledge acquired while working on this theme to your own particular business, please perform the following tasks:

- Define the objective of a research study on an aspect of the market that your company needs to examine.
- Consider the nature of the information required and propose the appropriate type of research.
- Identify secondary source information from inside your company and from external sources.
- Test a prototype of a simple questionnaire on a sample of your main customers. First, formulate closed or open questions, then arrange them in the form of a simple questionnaire.

Assessment of the theme

Answer the following questions, using additional pages as required.

1. What is the difference between exploratory research and descriptive research?

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2. For your company, which information would be from secondary sources and which from primary sources?

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3. What type of information is collected when quantitative and qualitative techniques are used in a research study?

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4. In your own words, what are the steps involved in the development of market research?

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Summary

MODULE 1

- Market information, both generated within the company and obtained from the outside, can be organized in what is known as a 'market information system'. Market research is a component of this system.
- Market research is defined as the collection, recording and objective analysis of data relating to a problem or to an opportunity for marketing the products and services of an agro-industrial enterprise.
- The main objective of market research is to provide valid information (not simply data) for use in the management's decision-making process, either as a way of solving a concrete problem or of defining an opportunity. In the context of an agro-industrial enterprise, market research helps to:
 - support the decision-making process by providing the information needed for making basic and long-term decisions in the company;
 - improve the company's management capacity;
 - provide management with valid information about the opportunities for product sales, factors that can influence sales and the best way to market products;
 - improve the company's profitability.
- Market research can be an expensive activity, especially in terms of time. It is therefore essential to design and limit it using well-defined objectives in order to estimate costs.
- The market research process includes the following stages:
 - definition of the problem or need for information;
 - definition of the objectives of the research;
 - identification and analysis of the information sources for the exploratory study prior to the fieldwork;
 - preparation of instruments and methods, including content, format and methods for obtaining data;
 - definition of the sample (e.g. the number of companies or consumers that will be included in the sample);
 - fieldwork;
 - processing of information;
 - analysis of information;
 - final report.

Theme 3: How is market information used?

INTRODUCTION

The information obtained from surveys is used to carry out planning. Planning is a fundamental tool for improving management because it helps to define the strategies and activities required to meet a specific objective. The marketing plan is based on the information that the company has obtained through its market information system, as well as on the results of market research.

The marketing plan is an operational document that guides the entrepreneur before, during and after the sale of the company's products. It contains the information necessary to make sales, as well as support for managing unforeseen situations.

This section contains guidelines to assist agro-industrial entrepreneurs in developing a marketing plan, while Module 4 provides details of planning principles for agro-industrial enterprises. Plans are then drawn up to guide the implementation of the activities required to achieve the enterprise's stated objectives.

EXPECTED RESULTS

After completing this theme, participants should have a better understanding of:

- the characteristics and importance of the marketing plan as a support tool to aid the company in improving its competitive position;
- how to prepare a marketing plan as a useful tool for organizing business activities and optimizing the use of resources, with a view to improving competitiveness.

TRAINING MATERIALS

Case study: Direct exporting

Reading for Theme 3: Preparing the marketing plan

PowerPoint presentation: Theme 3

Exercise on Theme 3

Case study**The trend towards removal of the intermediary – direct exporting****Introduction**

Fruit producers in Chile are entering into direct negotiations with importers. Low marketing margins, the desire to gain more control over their business and the growing professionalism of fruit producers have prompted some to enter into direct negotiations with importers, thereby eliminating intermediaries. *“The profit margins are so tight nowadays that it has become a necessity in recent years to export direct,”* confirmed the general manager of the El Recreo group. El Recreo is not an isolated case. It is part of a strategy developed by the Federation of Fruit Producers (FEDEFRUTA). Several business round tables have been organized with FEDEFRUTA support, including the First International Business Round Table on Chilean Fruits and Vegetables for Export. The organizers of the round table reported that the meeting brought together exporters of some 35 million boxes of exportable produce out of Chile’s total annual exports of about 180 million boxes.

The manager boasted that this year, for the first time, El Recreo group’s total production – which includes apples, kiwis and table grapes – would be sold to importers that the group itself had contacted. However, he stressed that it was doing business “in its own way” not because of poor relations with exporting companies but because of its strategy to improve producer incomes in today’s context of fierce international competition.

According to the manager, this is a trend that is here to stay: “If producers are not exporting direct within the next five to ten years, then I do not believe they will be very profitable.”

The company needs to have more control over the production process, including quality and safety during the production and marketing phases

The president of FEDEFRUTA believes that the main motivation of FEDEFRUTA members who choose direct export is the need to have more control over their own activities, rather than the specific needs of individual producers.

“When you are dedicated solely to production you lose direct control over your business. However, when you have control you know exactly which variables are affecting it. This is very important. Then if one day you have a fruit tree or a variety that is not profitable, you take it out,” stated the president, stressing that the group had no desire to compete with the large exporting companies.

The current objective of FEDEFRUTA is to open up new marketing opportunities for its producers and so improve their capacity to negotiate with intermediaries.

“External markets are open to all because exporting is not only for large enterprises, it is an entrepreneurial opportunity for anyone who enters this type of business,” stressed the president.

The fruit export manager of Tulio Callejero, Sons and Company believes that the professionalization of producers has also been vital in motivating several producers to become interested in exporting. “Today, producers are more knowledgeable than five or ten years ago and are able to sell directly overseas and carry out their own business,” said the manager.

“In my view, Chilean producers have excellent negotiating capacity. It is very professional. They are very aggressive, transparent and very clear. Compared with our experience in other Latin American countries, we are very satisfied,” stated a Chilean producer.

However, fruit producers who are already exporting point out that this route is not for everyone and several requirements must be met for direct exporting to be successful.

There is general agreement concerning the need for financial support to cover the costs of management travel or losses arising from problems. It is also important to explore new market destinations on a continual basis. “Markets such as China, Colombia, Panama and the Scandinavian countries are poorly developed, but they have interesting potential. On the other hand, fruit marketing in the United States of America and Europe is well consolidated. If you lift a stone, ten importers will run out! There is little to gain there,” affirmed the president.

There is also a demand for the development of products differentiated by superior quality. The keys to this are: good agricultural practices, certification and studies on global trends in fruit consumption.

Source: Based on *La tendencia a reducir el nivel de intermediación – La exportación directa*.
Newspaper ‘El Mercurio’, 2003. Santiago, Chile.

CRITERIA FOR ANALYSING THE CASE

After reading the above case study carefully, analyse it as follows:

- Identify the circumstances that prompted the El Recreo group to change its strategy for accessing markets.
- Reflect on the challenges that the company had to face in order to enter into direct negotiations with importers.
- The enterprises changed their marketing strategies, which involved formulating a marketing plan with objectives, strategies and actions. Which of the strategies can you identify?

The same tasks are listed at the end of Theme 3 so that they can be completed on the basis of the newly acquired knowledge.

Reading for Theme 3

Preparing the marketing plan

INTRODUCTION

Entrepreneurs use the marketing plan as a guide for the production and sale of their products. The marketing plan can be a section within the company's overall production plan and should integrate the conclusions of and useful information resulting from market research. The plan should include only information that contributes to successful marketing. In fact, it is likely that very little of the data generated during the market research will be included in the plan. Table 5 summarizes the phases and actions required in preparing the marketing plan.

A. Analysis of the current situation

The company's current situation is analysed in terms of its mission, objectives, business activities and the markets served. The analysis also takes into account the external and internal factors affecting the company.

TABLE 5

Phases in the preparation of the marketing plan

Phase	Action	Description
A.	Analysis of the company's current situation	Answer the question: Where is the company located? This will lead to an analysis of its location in relation to: <ul style="list-style-type: none"> • customers • markets • competition • product • distribution channels • prices • promotion
B.	Definition of objectives	They should be realistic and appropriate to the resources of the company
C.	Development and selection of strategies	Identify how to achieve the situation desired by the company
D.	Preparation of an action plan	Specifies the set of actions necessary to achieve the objectives
E.	Preparation of a budget	Financial details of the plan and its actions
F.	Execution of the monitoring and assessment stage of the plan	To ascertain whether or not the company is obtaining results and achieving its objectives; to provide corrective mechanisms, as required.

- ***Analysis of external factors***

Some of the information describing the company's current external environment comes from market research. Entrepreneurs can use this information to identify unsatisfied needs and business opportunities, market segments to be served, profitable niches, the general and specific characteristics of appropriate products for serving market segments and niches, the size of the available market, quality and safety requirements, etc. Based on these results, the company can draw up a plan to define how to achieve the identified objective(s). In addition to information on competition, prices and market trends, entrepreneurs should take into account the potential effect of external factors. These factors include the legal and labour aspects, as well as economic stability and government policies that might facilitate or hinder the implementation of a plan.

- ***Analysis of internal factors***

This is an analysis of the company's ability to implement a plan successfully. It identifies the strengths and weaknesses of the enterprise in terms of its ability to carry out the plan. More detailed information on this topic is provided in Module 4.

B. Definition of objectives

The idea identified by the market research must be transformed into concrete objectives through which the company quantifies what it wants to achieve and how. The internal and external analyses help to define realistic and achievable objectives. These objectives should be expressed in quantitative terms, using measurable financial indicators or other measurement units.

Examples of quantitative objectives

1. Increase sales by 10 percent.
2. Increase profits by 20 percent.
3. Capture at least five more customers.
4. Recover half the number of lost customers.
5. Increase market share by 5 percent.

C. Development and selection of strategies

In order to achieve the above objectives, it is essential for the company to establish strategies. The selection process for appropriate strategies is based on:

- defining the target population, i.e. the section of the market that the company wishes to reach;
- the general programme and the objectives with regard to the different marketing variables (product, price, place and promotion).

Example: definition of the target population

Sabor S.A. is a company that processes a variety of fruits into jellies, jams, compotes, etc. It identifies its target population as consumers who purchase goods in supermarkets or minimarkets, a segment of the middle class. Recently they have also begun to offer certain products in bulk, such as jams and jellies for high-end restaurants and bakeries. Even though data indicate that these are markets with a strong demand, the company has not yet succeeded in positioning its products satisfactorily.

D. Preparation of an action plan

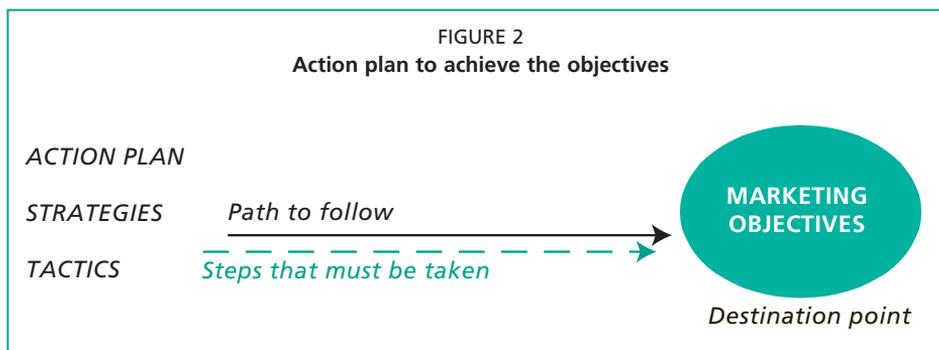
Once the strategies have been determined, an **action plan** is prepared for implementation within a prescribed time frame. An action plan is a useful planning instrument; it details the tactics that the company must use in order to achieve its marketing objectives. Figure 2 illustrates this concept.

The action plan is used to define the following:

- the activities that must be carried out;
- how they will be carried out;
- the time it will take to carry them out;
- who will be responsible for carrying them out;
- how the results will be assessed.

As an example, Table 6 shows the action plan prepared for the Sabor company, whose marketing objective is to introduce new products into its existing markets. The action plan is an operational document that should be simple, clear, concise and specific. It should define the objectives and actions and identify those responsible for carrying them out. The actions that help to achieve the objectives generally include:

- **Actions relating to products:** modification, removal and launching of new products, creation of new brands, expansion of the product range, quality improvement, new packaging and sizes, adding value to the product, etc.



- **Actions relating to prices:** review of current prices, change of policy on discounts, buying incentives.
- **Actions relating to place (distribution channels):** retailer support, wholesaler agreements, opening of new channels, improvements in delivery schedules, subcontracting of transport, internet sales and deliveries, etc.
- **Actions relating to promotion and advertising:** point-of-sale promotion and tasting campaigns, mass advertising, promotion at trade fairs and local events in the regions where the products are marketed, development of a brand differentiated by quality, etc.
- **Actions relating to the organization of sales:** modification of sales territories and routes, sales force commissions and incentives, order processing, etc.

E. Drawing up a budget

A **budget** is a document that quantifies or estimates the financial resources to be allocated to a set of planned activities. When a budget is approved, this only means that the use of financial resources has been authorized, whereas to achieve the objectives, a set of planned activities must be implemented by following an action plan.

The budget indicates how much money is required to carry out the activities proposed in the action plan. It is needed to ensure that there is a rigorous assessment of the consequences of any planned action (e.g. offering a promotion of two melons for the price of one). There are times when budget constraints make it necessary to adjust the action plan.

The budget should indicate when given amounts of money will be needed during implementation of the activities. It is also used for controlling the revenues and costs of the enterprise, as well as for identifying problems. In addition, it provides a good basis for accounting and financial transparency: when everyone can see how much was spent and received, questions can be asked about any discrepancies.

Guidelines for the preparation of a budget are presented in Module 4 and its Appendix 3.

F. Monitoring and assessment of the plan

Monitoring and assessment of the management plan provides feedback on the extent to which the objectives have been achieved (e.g. the sales of a specific product in a given month). It is also a way of recognizing partial achievement of the planned objectives over relatively short periods of time. This makes it possible to take almost immediate action when targets are missed.

Details of the assessment vary because they depend on identification of the 'key results areas'. These can be defined as topics that make the greatest contribution to the improvement of marketing management.

Reports are a useful tool in the assessment process because they show the development of activities over the short, medium and long term. Reporting allows regular adjustments to be made to the plan as part of a continuous process.

TABLE 6
Example of the action plan for a fresh fruit and vegetables processing company

Specific objectives	Activities	Requirements	Alliances needed	Responsible	Time	Indicators
Product 1. An offering of products suitable for consumers who use supermarkets	Review technical characteristics provided by the customers	Telephone calls		Rosa Ramirez (Marketing)		Technical specification sheet for product, to be cleared by all parties concerned
	Produce a short report	Customer specifications Specifications of current products or rejection Define conditions for acceptance or rejection Interviews with fresh produce manager		Luis Moreno (Production)		
	Prepare specifications for technical changes to products to be sent to Production	Formats of technical data sheets		Luis Moreno (Production)		Organization of changes to processes (product development) Written specifications prepared
	Prepare samples and technically evaluate them to check how they fit with requirements	Materials and support services for the process of preparing the products Packaging and sealing equipment External control services		Luis Moreno and Segundo Béjar		Samples evaluated and results produced
Price	Elaborate major issues for quality control and requirements to be met for products to be cleared before shipping to customers	Quality control data sheets Forms for data on rejects and customer complaints				Forms and data sheets prepared and records completed Number of customer complaints, by client and product
	Purchase packaging according to specifications	Materials for packing: bags, food grade packaging		Pedro Suárez (Packaging)		Recording of purchases made
	Contact suppliers Obtain quotes Decide on packaging to use.					
	Analyse competitors' prices and products. Negotiate minimum prices according to quantities to be delivered	Investigation of market prices and their historical and seasonal behaviour Negotiation meetings		Rosa Ramirez (Marketing) Company Manager		

TABLE 6
Example of the action plan for a fresh fruit and vegetables processing company (Continued)

Specific objectives	Activities		Requirements		Alliances needed	Responsible	Time	Indicators
	Training of sales personnel	Written support material	Presentation specialist	Training environment				
<p>Promotion and communication</p> <p>2. Strengthen the sales force and customer monitoring so that customers are satisfied with the product and service</p>	<p>Prepare set of materials and documents for sales (accreditations, quality controls, etc.)</p>	<p>Printing of logos</p> <p>Preparation of web page</p> <p>Quality documents and certificates</p>	<p>Blackboard, screen, projector, PC</p>	<p>Blackboard, screen, projector, PC</p>		Rosa Ramírez (Marketing) Company Manager		Training carried out
<p>Distribution</p> <p>3. Substantially improve the mechanisms for shipping products with appropriate and timely delivery</p>	<p>Review and organize the procedures associated with finished product shipment from the plant to the destination (type of transport to be used, whether refrigerated or not; if refrigerated identify the number of times the truck will be opened and assess the impact of temperature changes on product quality)</p>	<p>Procedures described</p> <p>Meetings with those in charge of transport</p>			Segundo Béjar (Production) Sergio Gálvez (Transport)	Sergio Gálvez (Transport)		Document on changes to procedures
	<p>Organize distribution routes and times according to orders</p>	<p>Information on main roads and routes, number of shipments, number of trucks and their capacities</p> <p>Record of shipping activities</p>						<p>Map of shipping routes</p> <p>Shipping records by type of product and customer</p> <p>Delays between shipment and reception by customer as well as unloading and acceptance of the product</p>
<p>Train workers responsible for shipping in the handling of products to meet quality assurance criteria</p>		<p>Written support material</p> <p>Presentation specialist</p> <p>Training environment</p> <p>Blackboard, screen, projector, PC</p>			Contracts with customers	Rosario Baca (Personnel) Julia Villegas (Quality Assurance)		<p>The most perishable products should be unloaded immediately to avoid loss of quality</p>

Periodic assessments can be carried out with a review of objectives and the budget, as follows:

Assessment of the annual plan: marketing activities and results are evaluated using the following tools:

- analysis of sales (sales achieved compared with expected sales);
- analysis of market share;
- analysis of the marketing effort/sales ratio (marketing investments versus sales);
- financial analysis;
- analysis of customer attitudes;
- analysis of competitor behaviour.

If the company detects poor results, adjustments should be made to the plan. Adjustments may include changing prices, reducing production, increasing pressure on the sales force, or reducing the costs of lower-priority items.

Assessment of profitability involves determining the current profitability of products. Profitability refers to the cost of producing and marketing in relation to the returns generated from sales. Profitability analysis reveals weaknesses, although it does not indicate whether or not they could be improved or eliminated.

Assessment of efficiency involves improvements to marketing activities such as sales, advertising, promotions and distribution.

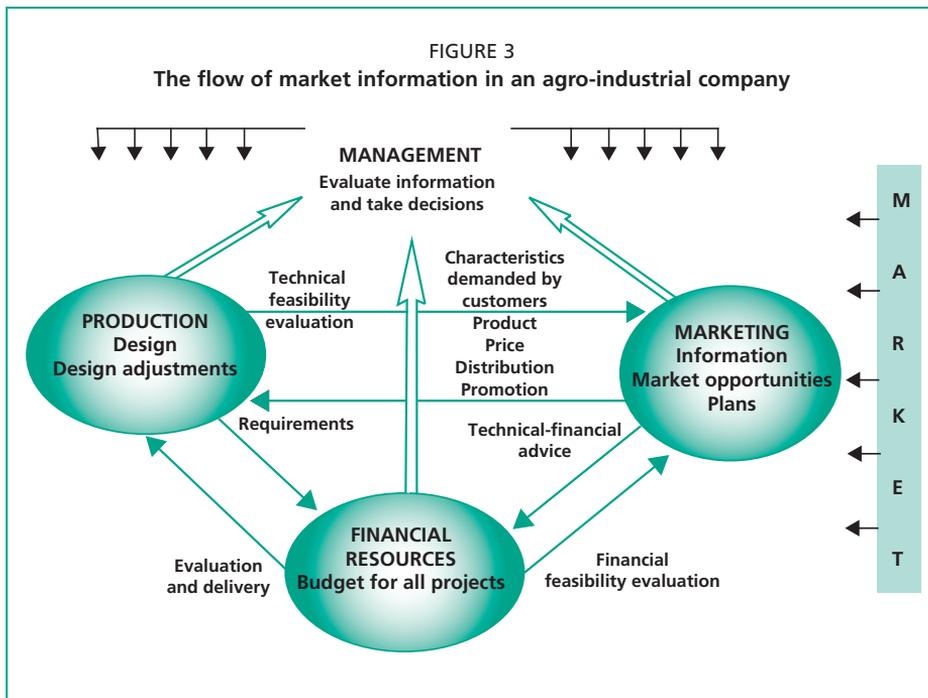
INFORMATION FLOW WITHIN THE ENTERPRISE

An enterprise comprises a set of interdependent parts that are not isolated from each other. The efficient functioning of an enterprise depends on how well it channels and processes information between its various parts and how effectively this information is used in the decision-making process. The marketing component uses tools to respond dynamically to a range of constantly changing opportunities and demands. For example, by responding to the flow of market information the enterprise can expand its market by introducing new products and reducing the production of unsuccessful products, or by applying any other strategy that appears profitable.

Information obtained by the company covers all areas, from management to operations, and is translated into plans such as the marketing plan. This process allows the company to make adjustments to its actions and strategies, which should result in improvements in all areas and processes.

Adequate output quality and the capacity to satisfy food safety standards are basic requirements for an agro-industry to enter new markets. A marketing plan must therefore consider quality and food safety in its product strategies. The diagram below illustrates the information flow and structure within a company.

Information flows from the market to the enterprise through channels created by the enterprise. Using an appropriate set of management tools the enterprise simultaneously processes and organizes this information in order to plan its future activities.



Any new information obtained on quality and safety requirements should be transmitted to the production department where the appropriate changes can be made to ensure that the market requirements are met. At the same time, the information should be transmitted to the finance department in order to assess the costs involved.

An agro-industrial company wishing to become more competitive should focus its efforts on integrated management. This takes the market as its starting point because that is where buyers' specifications and requirements are generated. Hence the importance of using management tools for collecting and organizing information for planning the company's activities. Figure 3 illustrates the concept of integrated management.

Exercise

COMPLETING THE CASE STUDY

After reviewing the content of this theme and comparing it with your own experience, review your responses to the tasks listed initially and try to correct or supplement them. Link your replies to the topics that have been covered in this section.

APPLYING THE EXERCISE

Apply the knowledge acquired in Theme 3 to your own company and attempt to answer the questions and complete the tasks below:

- As an agro-industrial entrepreneur, which marketing proposals should be included in a plan with objectives and strategies for achieving your company's targets?
- Define a marketing objective for your company by analysing internal and external factors.
- To achieve your objective you need to design strategies and activities relating to product, price, distribution and promotion activities. Identify and describe them.
- What are the requirements for implementing the marketing plan? Identify and list them.

Assessment of the theme

Answer these questions, using additional pages if required.

1. What are marketing plans and what are they used for?
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2. List the steps to follow in the preparation of a marketing plan.
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3. When product strategies are being established, which topics should be taken into account?
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4. What do monitoring and assessment of the marketing plan contribute and which aspects should be included?
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5. Why is it important for information to flow throughout the different areas of the company?
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Summary

- The marketing plan is an operational document, the purpose of which is to guide management in the production and sale of its products. The marketing plan can form a section of the company's production plan summarizing the conclusions and useful information collected through market research.
- The preparation of a marketing plan includes the following steps:
 - analysis of the company's current situation;
 - definition of objectives;
 - development and selection of strategies;
 - preparation of an action plan;
 - preparation of a budget;
 - preparation of a monitoring and assessment plan.
- The information flows from the market to the enterprise through channels designed by the enterprise to collect this information. At the same time the enterprise, with the support of management tools and based on the information received, processes, organizes and plans a sequence of actions guided by a set of plans.
- An enterprise does not comprise parts that are isolated from each other. On the contrary, its proper functioning depends on how well it channels and processes information between its various parts and how effectively this information is used in the decision-making process.
- An agro-industrial company wishing to become more competitive should focus its efforts on integrated management. This takes the market as its starting point because that is where buyers' specifications and requirements are generated. Hence the importance of using management tools for collecting and organizing information for planning a company's activities.

References

THEME 1

McGillivray, G. 1998. *Análisis económico e investigación de mercados para proyectos hortofrutícolas: manual de capacitación*. Programa Nacional de Capacitación en Manejo Post-Cosecha y Comercialización de Frutas y Hortalizas, Convenio SENA–Reino Unido, Centro Agroindustrial del SENA, A.A. 695, Armenia, Quindío, Colombia.

FAO. 2003. *Market research for agroprocessors*, by A.W. Shepherd. FAO marketing extension guide no. 3. Rome.

THEME 2

FAO. 2003. *Market research for agroprocessors*, by A.W. Shepherd. FAO marketing extension guide no. 3. Rome.

THEME 3

FAO. 2003. *Market research for agroprocessors*, by A.W. Shepherd. FAO marketing extension guide no. 3. Rome.

Appendix 1

Recommended further reading on Module 1 themes

THEME 1 : MARKET INFORMATION NEEDED BY THE COMPANY

Reading 1: Identifying market opportunities for rural smallholder producers. Good practice guide 3

Author: Ostertag, C.; Lundy, M.; Gottret, M.; Best, R.; Ferris, S.

Publisher: CIAT.

Year: 2007.

Document link: http://isa.ciat.cgiar.org/catalogo/listado_tools2010.jsp?pager.offset=5&tema=AGROENTERPRISES

Description

This publication combines market research, product concept evaluation and business analysis techniques, within a practical, innovative approach for identifying market opportunities for rural agroenterprise development projects within a defined area or territory. The participatory methods enable rural producers to make key decisions in market analysis and evaluation.

THEME 2: HOW IS MARKET INFORMATION OBTAINED?

Reading 1: Market research for agroprocessors

Author: Shepherd, Andrew W.

Publisher: FAO.

Year: 2003.

Document link: <http://www.fao.org/docrep/007/y4532e/y4532e00.htm>

Description

This guide describes in simple terms the type of market research that agro-industries can carry out and some of the forms used to do the research. The guide is aimed at entrepreneurs and companies that plan to develop or expand medium-scale agro-industrial businesses. We recommended reading Chapters 3, 4 and 5 relating to, respectively, research on consumer attitudes, information required for the presentation of the product and information regarding its distribution.

Reading 2: Direct marketing guide for producers of fruits, vegetables and other specialty products

Author: Hall, Charles R.

Publisher: Agricultural Extension Service, University of Tennessee

Document link:

<http://www.utextension.utk.edu/publications/pbfiles/PB1711.pdf>

Description

This guide provides an overview of direct marketing methods and gives suggestions for establishing a direct farm-to-consumer market and for developing a business plan; it also touches on advertising and promotion strategies.

Reading 3 : Training manual for small-scale enterprise for neo-literates

Author: United Nations Educational, Scientific and Cultural Organization

Publisher: UNESCO, Bangkok.

Year: 1999.

Document link:

<http://unesdoc.unesco.org/images/0011/001181/118121eo.pdf>

Description

The manual provides entrepreneurial skills for neo-literates or those who have completed literacy programmes and are keen to set up small-scale businesses in their own communities. Chapter 10 is recommended.

THEME 3: HOW IS MARKET INFORMATION USED?**Reading 1: Training manual for small-scale enterprise for neo-literates**

Author: United Nations Educational, Scientific and Cultural Organization

Publisher: UNESCO, Bangkok.

Year: 1999.

Document link:

<http://unesdoc.unesco.org/images/0011/001181/118121eo.pdf>

Description

The manual provides entrepreneurial skills for neo-literates or those who have completed literacy programmes and are keen to set up small-scale businesses in their own communities. Chapter 10 and handout 5.3 are recommended.

Reading 2: Management of agricultural marketing

Author: Crawford, I.M.

Publisher: Network on Training and Agricultural Marketing for East and West Africa. FAO Project GCP/RAF/238/JPN. FAO.

Year: 1999.

Appendix 2

Links and additional documents with market information for agro-industrial entrepreneurs in Central America

USEFUL LINKS

Ecomarkets

This is a project financed by the Swiss State Department for Economic Affairs and executed by INTERCOOPERATION (Swiss Foundation for Development and International Cooperation), which began operations in the Central American region (Costa Rica and Nicaragua) in January 2005. The objectives of Ecomarkets are: to promote the marketing of organic products; to support fair trade and its growth in local, regional and export markets; and to foster the access of small- and medium-scale producers in Central America to these markets, thereby contributing to an increase in their incomes and better employment opportunities. The Ecomarkets site delivers information relating to marketing opportunities for organic products and provides details of the principal export markets for these products.

<http://www.ecomercados.org>

Management tool box – Micro, small and medium enterprises, Guatemala

This tool has been designed in response to the needs of micro, small and medium exporters in Guatemala as a means to promote and diversify Guatemalan exports. The site provides, in a logical way, a step-by-step description of the export process presented in the form of a series of advisory notes so that the user can find details on any specific topic.

<http://www.infomipyme.com/Docs/GT/Offline/exportacion/index.htm>

Market studies for fruit and vegetable products

Commercial opportunities for fruit and vegetable products can be found on the web page of Partnerships for Food Industry Development, Michigan State University.

<http://www.pfid.msu.edu/>

Msfinfo.com – Sanitary and phytosanitary measures for fruits and vegetables

This site contains information on access to markets; it details the export procedures for Central American countries (Costa Rica, El Salvador, Guatemala, Honduras and Nicaragua) and the regulations for access to the markets of Canada, United States of America, Mexico and the European Union. The page was prepared by the regional program of Partnerships for Food Industry Development – Fruit & Vegetables (PFID-F&V) of the Michigan State University, financed by USAID under the cooperative agreement USAID/G-CAP 596-A-00-04-00039-00. This web page is updated and maintained by the Foundation for Support of Local Income Generation (AGIL)

<http://msfinfo.com/index.php>

ASSOCIATIONS OF EXPORTERS IN CENTRAL AMERICA

ANIERM, A.C. – National Association of Importers and Exporters of Mexico
http://anierm.org.mx/orbsite_xp/

APEN – Association of producers and exporters of Nicaragua
<http://www.apen.org.ni/>

CADEXCO – Chamber of Exporters of Costa Rica
<http://www.cadexco.net/>

COEXPORT – Corporation of exporters of El Salvador
http://www.coexport.com/index_highres.htm

EXPORT PROMOTION INSTITUTIONS IN THE REGION

BANCOMEXT – Bank of Foreign Trade, Mexico
<http://www.bancomext.com/Bancomext/index.jsp>

BELTRAIDE – Investment and Trade Promotion Service of Belize
<http://www.belizeinvest.org.bz/>

CEI – Export and Investment Centre, Nicaragua
<http://www.cei.org.ni/>

OEX – Export Promotion Fund, El Salvador
<http://www.foex.gob.sv/>

PROCOMER – Foreign Trade Promoter of Costa Rica
<http://www.procomer.com/>

VICOMEX – Vice-ministry of Foreign Trade, Panama
<http://www.mici.gob.pa/>

SUGGESTIONS FOR FURTHER READING

Central American supermarkets' private standards of quality and safety in procurement of fresh fruits and vegetables

Domestic food industry actors are implementing their own private standards for ensuring produce quality and safety. This is beneficial to consumers as these standards are among the few food safety practices implemented by domestic food industries. However, meeting higher level standards is a challenge for producers as it entails significant investments, implying the need for investment assistance and government support services. The paper presents the findings of field studies carried out in Costa Rica, Guatemala, El Salvador, Honduras, and Nicaragua from 2002 to 2004.

http://www.regoverningmarkets.org/en/resources/latin_america/central_american_supermarkets_private_standards_of_quality_and_safety_in_procurement_of_fresh_fruits_a_0

Inclusive business in agrifood markets: evidence and action

The report is composed of briefing papers, presentations, posters and discussions (in plenary and working groups) from this conference. It seeks to capture key points and is not intended as an exact or chronological record of the proceedings.

http://www.regoverningmarkets.org/en/resources/global/inclusive_business_in_agrifood_markets_evidence_and_action

The Japanese Market for Environmentally and Socially Certified Agricultural Products from Central America

This publication analyses the Japanese market for foods that have been certified with social and environmental standards, such as organic products, fair trade or Rainforest Alliance. The study was carried out in 2004 by the International Foundation of Organic Agriculture Movements (IFOAM), Japan, under the strict technical supervision of the Commodities and Trade Division of FAO with funds from the World Bank.

http://www.fao.org/ES/ESC/en/15/16/highlight_52.html

Appendix 3

Complementary reading

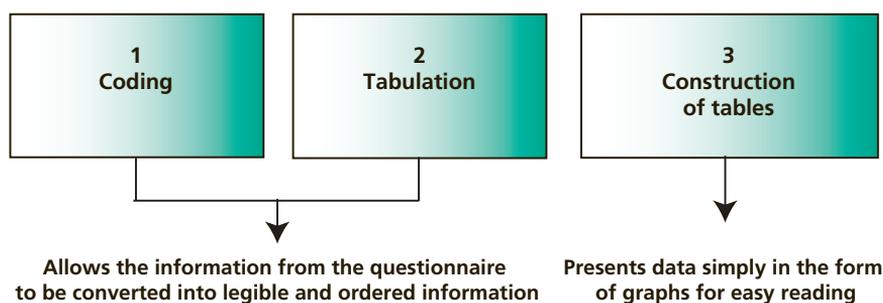
TECHNIQUES FOR PROCESSING COLLECTED INFORMATION

A mass of collected data is of no use for making business decisions until it has been analysed and prepared in a specific way. Some initial recommendations for handling information are listed below.

- Separate numerical data from data that have been expressed verbally.
- Numerical data should be processed in a way that is easily understood, using illustrative charts and tables.
- Data expressed verbally can be either converted into numerical data or remain as non-quantified or qualitative information.

As far as possible, data should be quantified. However, qualitative data are equally important. The difference lies in the degree of precision and complexity of the variables measured.

Once the criteria for each data category or subset have been chosen, the basic processing tasks can proceed. This entails three sequential steps.



CODING

Coding is the process of transforming verbal data into numerical data, which can then be processed numerically. The procedure is as follows:

- Similar types of information should be identified in order to group them. Such groups can be identified when there are many replies to the same question, or when several situations concern the same subject. In any case, there will be a variety of answers that all reveal a specific behaviour.
- A code is given to each type of response. This code can be a letter or number used to group responses or observations that are identical or equivalent.

While similar responses are almost always expressed in slightly different ways, they are easier to analyse afterwards if they are grouped together. Although there

could be any number of codes, it is preferable to limit them to the main groups of responses encountered.

- Ambiguous or inappropriate responses should be grouped under the code for 'others'.

Example

If questions are asked about opinions concerning fast food consumption, coding helps to group the responses in order to identify which are the most common opinions. For instance, the following codes could be established:

- They are a very good alternative for providing food requirements (A).
- They are not nutritious and so are harmful to health (B).
- They are the only alternative for people who lead a busy life (C).
- I have no idea what they are (D).

TABULATION

This refers to the preparation of tables containing previously grouped and quantified data. Each question should be included and tabulated. Tables should include all the responses received after they have been divided into categories.

Where there is a relatively small quantity of data, tabulation can be performed manually; otherwise it is convenient to use a computer for electronic data processing.

For manual tabulation, tabulation sheets must be created in which the data are distributed according to codes. A column should be created for responses,

Example

Variable: What is your opinion on the consumption of fast foods?

Code	Responses	Total
A	///	3
B	///////	7
C	//	2
D	////	5

If the first response analysed is from a person aged 23 whose opinion on the topic corresponds to code B, a mark should be placed in the second column in the row for code B. Another response corresponding to code A from a person aged 37 should be tabulated in the same way. The completed table shows whether opinions on the topic are affected by the age of the interviewees, or whether they are distributed uniformly across all age groups.

with marks placed next to the code representing the category of responses to the question being tabulated.

Finally, all the responses under each code are totalled.

When tabulating responses with various options (multiple choice), note that there is a distinction between:

- the total number of interviewees;
- the total number of interviewees who answer the question;
- the number of answers, according to the various motives or codes indicated.

In rare cases the results may appear incoherent, as in the following example.

In conclusion, when tabulating multiple choice responses, three elements should be tabulated separately:

- the total number of people interviewed;
- the total number of those who did not respond;
- the total number of responses for each code or category.

Example 2

What are the reasons for buying your food products in supermarkets?

Responses are obtained and grouped under four main reasons:

- to ensure food quality and safety
- for economic reasons
- for security and ease of purchase
- for the variety of products offered

The following table shows how the results are distributed. There are distinct total quantities that refer to different aspects of the same situation. One is the total number of people consulted (50); another is the number who actually responded (46) and finally, the total number of responses received (55), which means that some respondents have given more than one answer.

Total interviewed	50
Total number who replied to the question	46
Reasons identified	
Food quality and safety	27
Economic	2
Security and ease of purchase	12
Variety of products offered	3
Total responses	55

It can be concluded that 27 of those interviewed said they preferred to buy their food in supermarkets because of the quality and safety of the products offered, two for economic reasons, and so on for the other reasons identified.

TABLES AND GRAPHS

Tables and graphs should be prepared in order to produce results that can be easily interpreted, even by non-specialists. The information should be rigorously structured and the data presented logically, clarifying any element that could lead to confusion or different interpretations.

Recommendations for constructing tables include:

- Name the table clearly and accurately by indicating all the characteristics of the information presented. This should be done in a concrete, specific and concise manner. For example, if the question is “*Why do you prefer to buy your foods in supermarkets?*” the title of the table should be: ***Reasons why interviewees prefer to buy their foods in supermarkets.***
- When two variables appear in a table, the first variable mentioned should be the dependent variable, followed by the independent variable. For example, *interviewees’ opinions on the quality of food products that are sold in the supermarket and in the marketplace, according to age, where age is the dependent variable.* If another variable, such as gender, is added, it could be: *interviewees’ opinions on the quality of foods sold in the supermarket and in the marketplace, according to age and gender.*
- The next task is to convert the tabulated data into percentages to gain a better idea of what a particular element represents within the whole. Data is much clearer when presented in the form of percentages rather than as quantities and numerical totals.

If percentages are used, a brief glance at the data makes it possible to perceive differences and similarities, appreciate variations and trends and make comparisons with other studies.

Although it is recommended to work with percentages, for a small number of cases (between 15 and 20) data are usually presented as absolute numbers. When working with percentages, a base number must be selected as the quantity on which the percentage calculation is based.

- Unless many samples are being handled, the numbers presented should be rounded where possible, because too many decimals can be confusing.
- When dealing with multiple choice questions, the basis on which the percentages are calculated is always the total number of people who responded and not the total number of responses.

TYPES OF TABLE

When there is only one variable the table design is simple: one column of ordered data is presented.

When there are two or more variables it is important to present the independent variable horizontally and the dependent variable vertically. This is shown in the example below.

Example

Ages of interviewees

Total sample size	250
Total who responded	247*
	%
Aged under 25 years	30
Aged 26 to 39 years	25
Aged 40 to 59 years	21
Aged 60 and over	24

* Percentage calculations are based on this number

If the independent variable is age, which is believed to have an influence on the opinion of those interviewed, the opinions on the statement “products that are sold in bulk are unsafe” could be presented in the following way:

Example

Opinion of interviewees on the statement: “products that are sold in bulk are unsafe”

Age	Under Age 25	Age 26 to 39	Age over 40	Total
Opinions				
Total interviewed	83	103	61	247
	%	%	%	%
Agree	17	28	44	28
Neutral	23	22	25	23
Disagree	52	47	20	42
Do not know / no answer	8	3	11	7

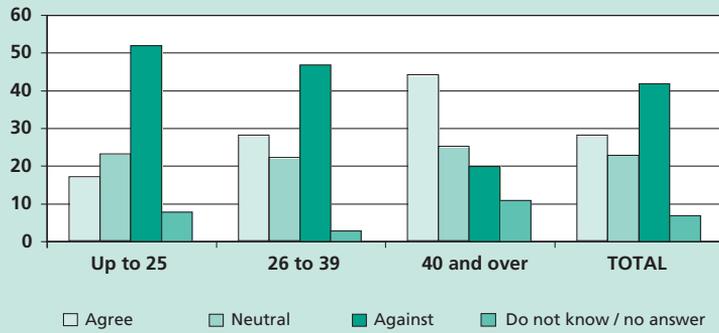
GRAPHS

Graphs express in visual form the numeric values that appear in the tables. The aim is to provide a broad, rapid and direct understanding of the information that has been presented elsewhere in the form of numbers.

Both specific and general information can be expressed in the form of graphs. A variety of graphs may be used, such as bar graphs, histograms and pie charts.

Example

Opinion of interviewees on the statement: "products which are sold in bulk are unsafe" according to age range



Cost-effective management tools for ensuring food quality and safety

FOR SMALL AND MEDIUM AGRO-INDUSTRIAL ENTERPRISES

The purpose of this manual is to improve and build the capacities of small and medium agro-industrial enterprises in order to guarantee the quality and safety of food products. The approach integrates the different factors that affect the capacity of a business to produce foods to meet market expectations and recognized standards, while maintaining and increasing the profitability and life of the business. Management and technical aspects are integrated through a practical and cost-effective approach.

The manual includes four modules on the following subjects: the use of market information for improving quality management; systems and tools for improving quality and safety management in agro-industry; the application of quality management principles in small and medium agro-industrial enterprises; planning as a tool for improving quality and safety management.

The manual contains case studies, exercises and bibliographic references, as well as a trainers' guide, PowerPoint presentations (on CD-ROM), appendices with further reading, links of interest and a glossary. The manual aims to assist trainers and entrepreneurs wishing to use the material for self-learning. With this manual, the Food and Agriculture Organization of the United Nations (FAO) provides the small and medium agro-industry sector in developing countries with an important tool for improving competitiveness and the capacity to deliver high-quality products to consumers.

Module 1: Use of market information for improving quality management

Cost-effective management tools for ensuring food quality and safety

FOR SMALL AND MEDIUM AGRO-INDUSTRIAL ENTERPRISES



Module 2: Systems and tools for improving quality and safety management in agro-industries



Cost-effective management tools for ensuring food quality and safety

FOR SMALL AND MEDIUM AGRO-INDUSTRIAL ENTERPRISES

Module 2: Systems and tools for improving quality and safety management in agro-industries

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Foreword

The Rural Infrastructure and Agro-Industries Division (AGS) of FAO works to improve and strengthen the capacities of small and medium agro-industries, the enterprises that provide them with services and materials and the relevant support organizations in order to ensure food quality and safety. It carries out these activities using an approach that integrates the different factors affecting the capacity of a business to produce foods to meet the demands of the market according to recognized standards, while maintaining and increasing the profitability and viability of the business. Management and technical aspects must be integrated within a practical and cost-effective approach. This ensures that higher incomes, sources of jobs and the food security of the rural population are also promoted.

The training manual entitled *Cost-effective management tools for ensuring food quality and safety – for small and medium agro-industrial enterprises* focuses on these objectives.

This manual is the result of a collaborative effort by technical staff of the Rural Infrastructure and Agro-Industries Division of FAO. It is based on case studies carried out in Bolivia and El Salvador on opportunities for the improvement of capacity of small- and medium-scale food processing enterprises, through training to meet the demands of the market.

These case studies, which were carried out as part of the FAO programme ‘Agribusiness Development: Small and Medium Post-production Enterprises’, identified the training needs of small and medium fruit and vegetable agro-industries. This sector had been chosen as representative of the food industries operating in Latin America.

In Bolivia, a range of agro-industries was evaluated. These produced: (i) processed dried fruits, jams and/or fruit pulps, particularly pineapple and peaches; (ii) processed vegetables such as faba beans and garlic; (iii) various processed products such as pickles.

In El Salvador, the study focused on the development of products such as tomato-based foods, fruit juices and nectars (including peaches, apples, grapes and tropical fruits), as well as other fruit and vegetable products. This made it possible to identify problems common to the different enterprises, such as low-quality raw materials, inefficient processing operations, lack of knowledge of the relevant quality and safety standards and their implementation and lack of entrepreneurial vision. There was a consensus among small-scale entrepreneurs that these problems could be overcome by implementing innovative training strategies. This consensus led to the idea of preparing this manual.

The manual is divided into four modules, each subdivided into themes. Module 1 discusses the use of market information as a tool for business decision-making. Module 2 covers systems and tools for improving the management of food quality and safety in agro-industry. Module 3 focuses on the principles of quality

management in small and medium agro-industrial enterprises. Module 4 discusses planning as a tool for the management of food quality and safety.

This manual includes case studies, exercises and bibliographic references, as well as a trainer's guide, PowerPoint presentations, appendices, further reading and links of interest.

The purpose of this manual is to assist trainers and entrepreneurs wishing to use the material for self-learning. With this manual, FAO can now provide the small and medium agro-industry sector in developing countries with an important tool for improving its competitiveness and its capacity to deliver high-quality products to consumers.

The English version has been revised to include references, recommended reading and links suitable for English readers. In Module 2, information on standards and regulations relating to quality and safety has been included in order to provide norms that are relevant worldwide.

Geoffrey C. Mrema

Director

Rural Infrastructure and Agro-Industries Division

Acronyms and abbreviations

ANSI	American National Standards Institute
BRC	British Retail Consortium
BSI	British Standards Institution
CAC	Codex Alimentarius Commission
CPMA	Canadian Produce Marketing Association
EAN	European Article Numbering Association
EFSA	European Food Safety Authority
EU	European Union
FSIS	Food Safety and Inspection Service (of the United States Department of Agriculture)
GAP	good agricultural practices
GLOBALGAP	pre-farm-gate standard for good agricultural practice (formerly known as EUREPGAP)
GMP	good manufacturing practices
GPP	good production practices
GTIN	global trade item number
HACCP	hazard analysis and critical control points
IFS	International Food Standard
IICA	Inter-American Institute of Cooperation in Agriculture (IICA)
ISO 14000	family of ISO standards on environmental management
ISO 22000	ISO standard on food safety management systems
ISO 8402	ISO standard on quality management and quality assurance vocabulary
ISO 9000	family of ISO standards on good quality management practices
ISO 9000:2000	ISO 9000 family of standards issued in 2000
ISO 9001	ISO standard providing a set of standardized requirements for a quality management system
ISO 9001:2000	ISO 9001 standard issued in 2000
ISO	International Organization for Standardization
PMA	Produce Marketing Association (United States)

PROMPEX	Office for the Promotion of Peruvian Exports
Regulation 178/2002	Regulation (EC) No 178/2002 of the European Parliament and of the Council of 28 January 2002 laying down the general principles and requirements of food law, establishing the European Food Safety Authority and laying down procedures in matters of food safety
Regulation 852/2004	Regulation (EC) No 852/2004 of the European Parliament and of the Council of 29 April 2004 on the hygiene of foodstuffs
SFI	Safe Food International
SPS	sanitary and phytosanitary
SQF 1000	Safe quality food standard for primary producers
SQF 2000	Safe quality food standard for manufacturers and distributors
STDF	Standards and Trade Development Facility
UCC	United States Uniform Code Council
UNECE	United Nations Economic Commission for Europe
UPC	Universal product code (United States)
USDA	United States Department of Agriculture
WHO	World Health Organization

Study guide for the module

SYSTEMS AND TOOLS FOR IMPROVING QUALITY AND SAFETY MANAGEMENT IN AGRO-INDUSTRY

Objectives	<ul style="list-style-type: none"> • To recognize the importance of a proactive approach to quality and safety in agro-industrial enterprises. • To review the tools and systems available for ensuring food quality and safety throughout the agrifood chain. • To illustrate the principles of product traceability and their importance as a support mechanism in food quality and safety programmes.
Content	<p>Theme 1: Management of food quality and safety in agro-industry</p> <ul style="list-style-type: none"> • Quality and safety assurance are the responsibility of every actor in the chain. • How to ensure food quality and safety. • General review of programmes and standards for improving quality and safety management: good agricultural practices. Voluntary and mandatory initiatives in food safety and quality standards. <p>Theme 2: The importance of product traceability in quality and safety management</p> <ul style="list-style-type: none"> • Advantages of applying product traceability principles in agro-industrial enterprises. • Steps in implementing product traceability tools. • Application of product traceability tools in accordance with mandatory and voluntary standards. • Considerations when adopting product traceability tools. • Product traceability approaches.
Activities	<p>Case study: Improving quality and safety as a strategy for enhancing the competitiveness of agro-industrial enterprises</p> <ul style="list-style-type: none"> • Exercise on Theme 1 <p>Case study: The importance of traceability in agro-industry</p> <ul style="list-style-type: none"> • Exercise on Theme 2
Assessment	<p>At the end of each theme the participants carry out an exercise to assess their general understanding of the theme.</p>

INTRODUCTION

The sustainability of an agro-industrial company depends largely on its capacity to obtain information on what is happening in the market and its skill in exploiting that information to react to market signals. Module 1 of this manual explains the importance of market information as a decision-making support tool.

Another important component for accessing markets is knowledge of customer requirements for quality and safety, combined with an awareness of the public and private standards within the target market. Consumer demands are not limited to the quality aspects, which they can judge themselves, but increasingly consumers are asking how products are produced and what guarantees a company can offer in terms of its commitment to quality and safety. These considerations apply not only to the final product, but also to how a company approaches all its management processes.

Module 2 illustrates some of the programmes, systems and tools for ensuring product quality and safety, as well as for improving the management of agro-industrial enterprises.

CONTENT

Module 2 is divided into two themes.

Theme 1: Management of food quality and safety in agro-industry

This theme presents the integrated chain approach to food quality and safety and describes the principal programmes and systems for ensuring quality and safety, as well as standards aimed at improving their management throughout the value chain.

Theme 2: The importance of product traceability in quality and safety management

This theme illustrates the importance, principles and advantages of product traceability, a tool that contributes to the effectiveness and efficiency of measures to improve safety and quality in agro-industrial production. This includes the application of these principles in small and medium agro-industrial enterprises.

ESTIMATED TIME

An estimated total time of 10 hours should be sufficient to complete this module, including the time required for carrying out formal training sessions, practical exercises, reviewing materials and other activities.

Theme 1: Management of food quality and safety in agro-industry

INTRODUCTION

Food hygiene and safety requirements for marketing have been increasing at both international and national level. This has led to changes in production and preparation processes to enable producers and agro-industrial managers to ensure the quality and safety of food products. This is done by controlling and preventing product contamination and loss of quality at each stage of the production, processing and distribution chain.

Over the past decade, more and more agro-industrial enterprises have been adopting programmes such as: good agricultural practices (GAP); good manufacturing or good production practices (GMP/GPP); hazard analysis and critical control points (HACCP); and quality and safety management systems such as standards ISO 9001 and ISO 22000. These systems have emerged in response to a loss of consumer confidence in food quality and safety, the need for the authorities to protect consumer health and the need to guarantee food quality and safety in commercial operations. Food safety has increasingly moved up the agenda of most countries, mainly in the developed world, especially since 1990 with the bovine spongiform encephalopathy (BSE) – or ‘mad cow disease’ – crisis, followed by the occurrence of the extremely pathogenic avian influenza virus H5N1 (‘bird flu’) in 2003. In many countries the situation has been aggravated by outbreaks of food-borne infections or diseases and by an increase in heavy metal contamination.

Pressure for better quality and safety is expected to increase. Producers and entrepreneurs must therefore adopt a proactive approach to quality and safety issues because, when problems occur, they have serious negative consequences for the company concerned. They could also have global repercussions on the entire sector producing and marketing the product.

EXPECTED RESULTS

By the end of this theme participants are expected to have a better understanding of the importance of:

- a preventive approach to quality and safety management;
- guaranteeing food quality and safety throughout the agrifood chain;

- implementing and improving quality and safety management programmes in agro-industrial enterprises;
- improving the links and synergies between product quality and safety systems and programmes.

SUPPORT MATERIALS

Case study: Improving quality and safety as a strategy for enhancing the competitiveness of agro-industrial enterprises

Reading for development of the theme: Quality and safety assurance in the agrifood chain

PowerPoint presentation: Theme 1

Exercise on Theme 1

Case study**M
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Improving quality and safety as a strategy for enhancing the competitiveness of agro-industrial enterprises

Introduction

Peru is currently the world's largest exporter of fresh asparagus and is the second largest exporter, after China, of processed asparagus. Peru has achieved this by positioning itself in the global market as a supplier of asparagus of excellent and consistent quality. How has the Peruvian asparagus industry achieved such success in an increasingly demanding and competitive globalized market? What are the success and change factors that have made it possible to establish a sustainable industry that has significantly impacted the Peruvian economy by generating foreign exchange?

Development

Peru's world leadership as an asparagus supplier has been achieved mainly through the commitment of Peruvian industry to the quality and safety of exported asparagus, while incorporating into its strategic business plans competitiveness in terms of quality.

Commitment to asparagus quality and safety

Safety is the most important and critical element of quality standards for any food product. However, little is achieved if safety is not accompanied by the quality factors demanded by consumers in excess of statutory health requirements. Quality in the broadest sense of the word is vital when competing in the global market.

One of the main planks of Peru's export promotion policy is recognition that the success of agro-industry depends on the quality and safety of its food products. As part of government support programmes, the Office for the Promotion of Peruvian Exports (PROMPEX) has reinforced product standardization. It also supports exporting companies GAP, GMP, HACCP, standard ISO 9000, social responsibility and other programmes. The actions of the Ministry of Agriculture in the fields of plant health and agricultural practices, and of the Ministry of Health for inspection and control in packing houses and processing plants, are also important for the asparagus production chain.

These actions coincide with the commitment of the production sector, which is directly responsible for food safety. A system taking an integrated approach to the quality and safety of asparagus exports is being built and has been establishing itself successfully. This integrated approach ensures the quality and safety of Peruvian

asparagus throughout the production chain: (i) in the field, through the implementation of GAP; (ii) in the handling and processing phases, through the application of HACCP and (iii) in storage and shipment, through control of the cold chain. The asparagus industry applies other HACCP-compatible quality systems required by its customers; these systems provide quality management and environmental protection, while supporting the principles of social responsibility. Other systems are also being introduced to ensure security control for logistics within the chain.

Outcome

All asparagus exporting companies have now implemented the HACCP system and they have invested more than US\$1 million in quality improvement programmes (Campbell, 2006). These efforts have resulted in a product of the highest quality for the most demanding markets, witnessed by the rising volume of international exports.

Source: Based on the report of the Plant Health and Food Safety Programme of the Inter-American Institute for Cooperation in Agriculture (IICA) *Mejorando la competitividad y el acceso a los mercados de exportaciones agrícolas por medio del desarrollo y aplicación de normas de inocuidad y calidad. El ejemplo del espárrago peruano*, by O'Brian, T. & Díaz R.A., 2004.

CRITERIA FOR ANALYSING THE CASE

After reading the case study carefully, analyse the text, as follows:

- Identify the success factors of the Peruvian asparagus industry that could have motivated quality and safety innovations. Analyse the factors relating to the enterprise, to the Government and to organizations in the sector.
- Analyse the results of PROMPEX actions to develop quality and safety protocols that led to an improvement in the sector's competitiveness.
- Identify initiatives you have undertaken to guarantee food quality and safety (whether or not they have been consolidated), from which you have learned and made improvements.
- Identify lessons learned from the Peruvian asparagus industry that can be applied or considered in your company.
- Specify which of the market aspects studied in Module 1 contributed to the success of the Peruvian asparagus sector: product, price, place and promotion.
- Do you think that the success of the Peruvian asparagus agro-industry is also related to leadership, organization of the enterprises and a continual improvement approach?

The same tasks are listed at the end of Theme 1 so that they can be completed based on the newly acquired knowledge.

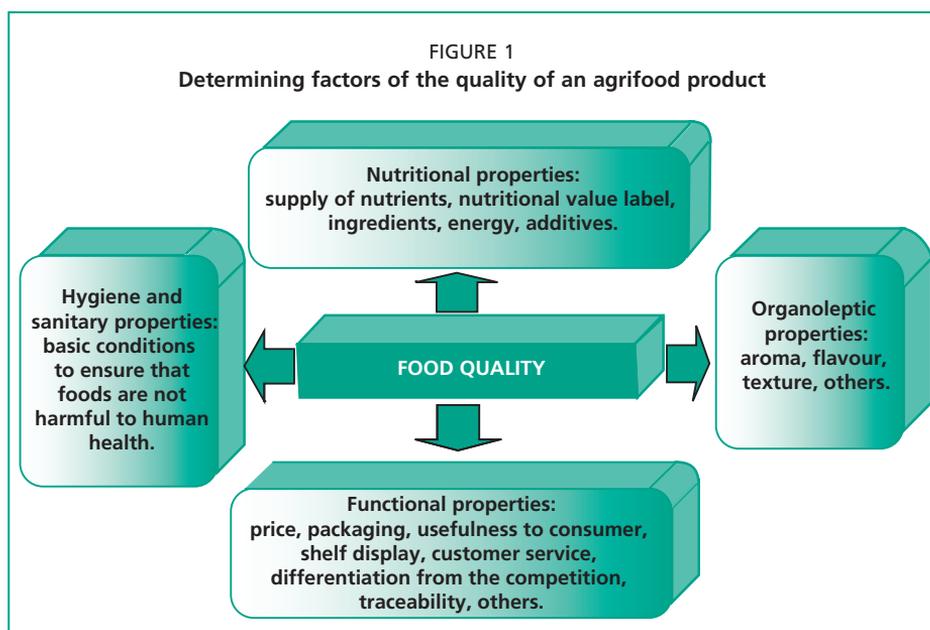
Reading for Theme 1

Quality and safety assurance in the agrifood chain

INTRODUCTION

Quality and safety assurance is the part of quality management aimed at creating confidence that local quality and safety requirements (or those demanded by target markets) are being met. As mentioned in Module 1, quality is an intrinsic characteristic of foods. This means that certain predefined requirements must be satisfied. The factors that determine food quality can be divided into four groups, as shown in Figure 1.

Product quality refers to the objective or subjective value attributed to one or more of the four qualitative properties identified below. Agro-industry therefore has a special responsibility for improving quality, especially in terms of safety. The *Codex Alimentarius* defines safety as the assurance that food will not cause harm to the consumer when it is prepared and/or eaten according to its intended use. From the safety viewpoint, the dangers associated with fresh products are classified into three groups: biological, chemical and physical. More information on these topics can be found in the FAO manual for trainers *Improving the quality and safety of fresh fruits and vegetables: a practical approach*. Programmes

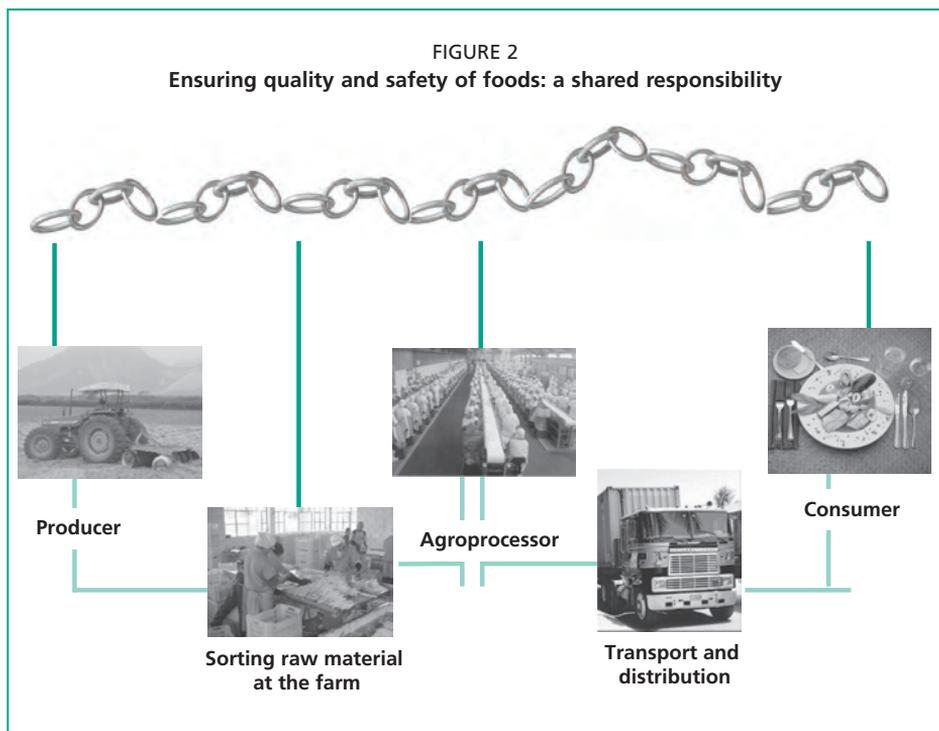


for ensuring food safety are based on the principle of risk assessment and on the application of preventive measures for controlling the occurrence of such dangers throughout the supply chain.

QUALITY AND SAFETY ASSURANCE ARE THE RESPONSIBILITY OF EVERY ACTOR IN THE CHAIN

All the actors in the chain – from primary producers (suppliers), processors, packers, transporters and distributors up to the point of sale, ending with the consumer – share responsibility for implementing measures to prevent and control food contamination and deterioration. As it is so important, each link in the chain must be aware of the problem and act responsibly. However, in most developing countries the various actors show very little awareness. This, together with deficiencies in production, processing and distribution infrastructure and poor control systems, limits progress in this area. Although many countries have made progress in the agrifood export sector, so far these developments have not had enough of an impact on production and distribution chains serving domestic markets (Figure 2).

One of the main challenges facing the institutions that promote food quality and safety is to raise awareness amongst agents involved in the chain of the relevance of food quality and safety and of each agent's role in achieving the necessary improvements. This has major implications for production, product-



handling, processing, distribution and associated practices. This includes the following concepts:

- Considering agriculture as a process for transforming resources into foods that people are going to eat; it is therefore vital to the sustainability of the agricultural sector, as well as agro-industrial businesses, to ensure food quality, safety and integrity .
- Understanding the need for closer integration between the various links in order to improve quality and safety.
- The importance of applying a chain approach where all the agents involved share responsibility for supplying safe and nutritious foods.

There is no doubt that, in the future, the food trade will be governed by rules and standards of conduct. In practice these rules will block access to markets by countries and enterprises that fail to comply with the:

- requirements of the domestic or international value chain in terms of voluntary or mandatory standards;
- demands of the control authorities of importing countries and of health protection programmes.

HOW TO ENSURE FOOD QUALITY AND SAFETY

Quality and safety management systems cover the policies, structures and procedures implemented by agro-industrial enterprises, as well as responsibility for the quality and safety of the products they produce and market. According to FAO (2006), a quality and safety management system should include the following.

- The implementation of good practices throughout the production chain. This entails implementing programmes with minimum prerequisites both at farm level (good agricultural practices) and at the handling, distribution, storage and processing stages (good manufacturing and good hygiene practices), as well as published standardized operational procedures.
- The application of HACCP system principles. The HACCP system is designed to identify and prevent risks that are unique or specific to the food or process in question and so it identifies critical points that reduce or eliminate these risks for a particular food. Each HACCP system is designed specifically for one food process or processing plant and is applicable only after the prerequisite programmes described above have been implemented.
- The implementation of a management system at senior management level that incorporates commitment and responsibility, monitoring and assessment of the entire system and application of the principles of continual improvement by senior management. Examples include the improvements required by ISO 9000 version 2000 standards, in terms of quality management, as well as those required by standard ISO 22000 in terms of safety management.

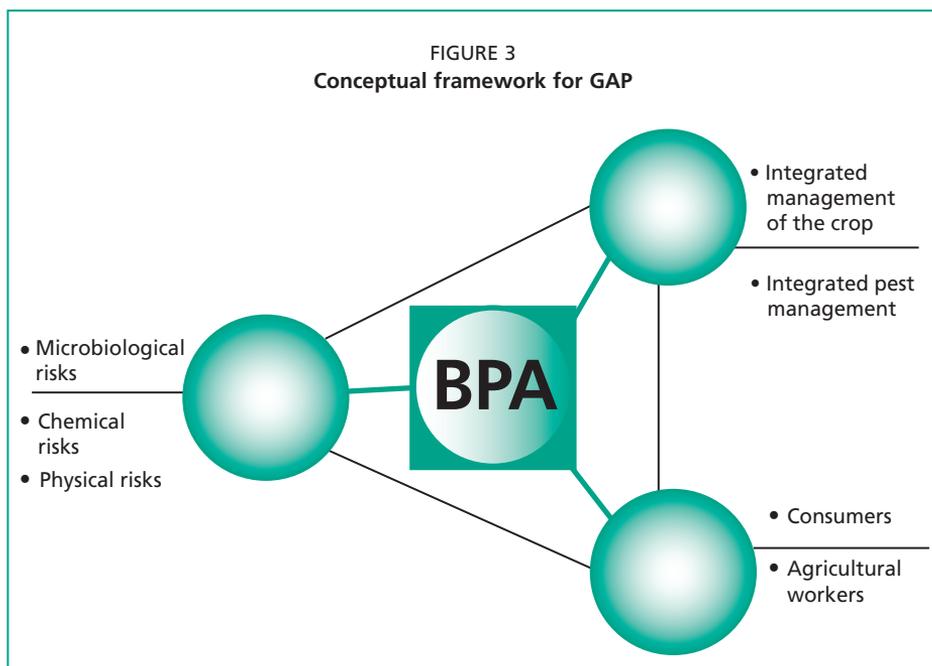
Many of the public and private standards aimed at ensuring optimal quality and safety at various stages of the production and processing chain are based on applying HACCP to the management of raw materials and other inputs.

GENERAL REVIEW OF PROGRAMMES AND STANDARDS FOR IMPROVING QUALITY AND SAFETY MANAGEMENT: GOOD AGRICULTURAL PRACTICES

Good agricultural practices refers to a set of principles, standards and technical recommendations aimed at improving conventional methods of production and handling in the field. They focus on risk and the prevention and control of risks affecting product safety, while at the same time reducing the negative impact of production practices on the environment, fauna, flora and workers' health.

The scope of GAP therefore extends beyond safety alone to incorporate environmental and social considerations as part of the economic, technical and environmental sustainability of production systems. Figure 3 illustrates the conceptual framework for GAP, for which FAO prepared a proposal: *Development of a framework for good agricultural practices* (Seventeenth session of the FAO Committee on Agriculture).

For agro-industrial enterprises, GAP is an important component that ensures the safety of the foods they offer. Companies whose activities extend to production have direct responsibility for applying GAP. Responsibility is indirect when a company's activities are confined to preparing and processing the product. In this case, the company is responsible for applying controls to the products entering the plant to ensure that they have been produced in keeping with a GAP approach and that the producer and the other actors involved have taken the necessary measures to reduce any risk of product contamination and deterioration.



Source: Adapted from *Manual de buenas prácticas para el sector hortofrutícola de exportación* (Fundación para el Desarrollo Frutícola de Chile), 2002.

A practical approach to the application of GAP programmes is illustrated in the FAO manual for trainers, *Improving the quality and safety of fresh fruits and vegetables: a practical approach*.

GOOD MANUFACTURING PRACTICES

Good manufacturing practices (GMP) are based on risk analysis and are designed to minimize and control risks to product safety during preparation and processing, while minimizing the negative impact on the environment, fauna, flora and workers' health. GMP implementation is based on applying the **General Principles of Food Hygiene of Codex Alimentarius**, the pertinent **Codes of Practice of Codex Alimentarius** and the corresponding legislation on food safety. The Codex Alimentarius *International Code of Practice – General Principles of Food Hygiene* identifies the key principles of food hygiene applicable throughout the food chain and recommends the application of HACCP criteria to improve food safety.

GMP programmes include recommendations in the following areas:

- requirements for the design of infrastructure and facilities;
- maintenance programmes for facilities, equipment and sanitation;
- control of operations, including food product risk control, hygiene, pest control, control of raw materials, packing, water quality, temperature control, management and supervision, documentation and records and procedures for rejects and the recall of unsafe products;
- staff hygiene;
- transport;
- information concerning the product and for the consumer (product identification and labelling and consumer information);
- staff training.

In many countries, GMP programmes in the agrifood sector have progressed from being a voluntary requirement to becoming part of the national regulatory framework and are now mandatory. This is the case in Argentina, Bolivia, Colombia, Ecuador, Mexico, Paraguay and Venezuela. In April 2006, the Central American countries agreed to a technical regulation on GMP for the region (*RTCA 67.01.33:06 Industria de Alimentos y Bebidas Procesados. Buenas prácticas de manufactura. Principios generales* [Processed food and beverage industry. Good manufacturing practices. General principles]). In the European Union, Regulation 178/2002 laying down the general requirements and principles of food law and all the subsequent regulations, especially Regulation 852/2004 on the hygiene of foodstuffs, there is a mandatory requirement to comply with the General Principles of Hygiene, plans based on the principles of HACCP and traceability of all foods circulating on European Union territory.

For agro-industrial enterprises, the responsibilities and benefits of implementing GMP programmes entail mainly compliance with national and international standards and regulations for improving quality and safety management in the company. This leads to improved efficiency and organization and, more

importantly, it reduces the risk of marketing contaminated products, with the resulting loss of reputation as a reliable supplier.

THE HAZARD ANALYSIS AND CRITICAL CONTROL POINTS SYSTEM

The HACCP system is used to identify, assess and control hazards that are significant for food safety. The systematic and preventative HACCP approach is designed to identify biological, chemical and physical risks and to establish measures for controlling these risks in order to guarantee the safety of the foods involved. The system focuses on prevention rather than inspection, coupled with testing of the final products.

PRINCIPLES OF THE HACCP SYSTEM

The Codex Alimentarius Commission (CCA) recommends the adoption of the HACCP system in order to increase food safety. The HACCP principles have been incorporated as an annex to the *International Code of Practice – General Principles of Food Hygiene. Guidelines for their application*. The system is based on seven principles:

1. Conduct a hazard analysis.
2. Determine the critical control points (CCPs).
3. Establish critical limit(s).
4. Establish a system to monitor control of each critical control point.
5. Establish the corrective action to be taken when monitoring indicates that a particular critical control point is not under control/s.
6. Establish procedures for verification to confirm that the HACCP system is working effectively.
7. Establish documentation concerning all procedures and records appropriate to these principles and their application.

FAO has produced a training manual that combines all the principles of GMP and food hygiene, together with guidelines on the components and applicability of the HACCP system: *Food quality and safety systems – A training manual on food hygiene and the hazard analysis and critical control point (HACCP) system*. The HACCP system has become the basis for official food control and the establishment of standards applicable to international trade.

In the majority of developing countries, there are public and private initiatives to establish HACCP training programmes. Various types of incentive and support have been set up to facilitate its application mainly by small and medium agro-industrial enterprises. With few exceptions, HACCP has become part of the mandatory regulations for the food sector in developing countries. The HACCP system has been incorporated into the regulations of several developed countries. For example, in the United States of America, it is mandatory in the juice, meat and citrus industries.

Implementation of the HACCP system, or other systems based on its principles, calls for a certain level of resources to be made available to support the necessary infrastructure investment and to ensure the operation of the HACCP

system itself. Additionally, there must be a sufficient number of qualified people that understand HACCP system principles and the importance of implementing the system. Access to the required financial, technical and administrative resources for implementing the HACCP system is often a constraint, especially in small and medium enterprises.

FAO is currently preparing a document to guide governments in designing policies and strategies that provide incentives for the application of the HACCP system and systems based on its principles. The joint FAO/World Health Organization (WHO) document, entitled *FAO/WHO guidance to governments on the application of HACCP in small and/or less-developed food businesses*, will be used as a basic tool for promoting the development of food quality and safety, principally in small and medium enterprises. It may be consulted by clicking on the relevant link on the FAO Food Safety and Quality web page (<http://www.fao.org/ag/agn/agns/>).

In addition, private standards established in importing countries have helped to promote quality assurance programmes based on HACCP or its principles. Some examples are: the British Retail Consortium's global standard for food BRC Global Standard for Food Safety Issue 5, and The American Safe Quality Food Institute's SQF 2000 Code. Many companies have opted for voluntary implementation of the HACCP system as a means to create confidence among suppliers and buyers concerning the company's commitment to product quality and safety.

The benefits to be gained by an agro-industrial company implementing the HACCP system include:

- guaranteeing the safety of its products;
- using the company's resources effectively;
- reducing costs and defective products, thereby increasing productivity;
- consolidating the company's image and credibility among its consumers;
- enhancing the company's capacity to respond to any safety problems that may arise.

In conclusion, while prerequisite programmes and the HACCP system are aimed at preventing and controlling food safety risks, the standards relating to quality and safety management demonstrate the company's commitment to higher quality and safety standards, mainly in the management and operational areas.

QUALITY MANAGEMENT SYSTEMS: STANDARD ISO 9001

The International Organization for Standardization (ISO) was established by many countries, both large and small, in every region of the world. ISO develops voluntary technical standards that add value to all types of business operations. The standards it develops help to make the development, production and delivery of products and services more efficient, safer and cleaner, as well as facilitating international trade. Some countries adopt ISO standards as part of their national standards or regulations.

ISO defines a quality management system as the structure within a company that is used to manage processes and activities to transform raw materials into

TABLE 1
Series of standards ISO 9000

ISO 9000	ISO 9001	ISO 9004	ISO 19011
Fundamentals and vocabulary	Requirements	Recommendations to improve performance	Audit
Describes the basics of quality management systems and specifies the terminology used	Specifies the requirements for quality management systems applicable to the enterprise	Provides instructions for improving the effectiveness of the company's management system	Provides requirements for auditing of quality and environmental management
	Certifiable		

products and services that satisfy business objectives, such as meeting customer quality requirements or complying with legal requirements. The benchmark for quality management systems is the ISO 9000 series of standards, applied in a range of sectors (see Table 1). Standard ISO 9001:2000¹, for which certification is granted, contains a number of requirements for the planning, implementation and continual improvement of a quality management system within a company to ensure that its products meet customer needs and expectations and comply with legal requirements and regulations.

Standard ISO 9001:2000 specifies the requirements for a company to:

- demonstrate its ability consistently to provide products that meet customer requirements and applicable regulatory requirements;
- enhance customer satisfaction through the effective application of the system, including processes for continual improvement of the system and the assurance of conformity to customer requirements and applicable statutory and regulatory requirements;

The eight quality principles on which standard ISO 9001:2000 is based are:

- customer focus;
- leadership;
- involvement of people;
- process approach;
- system approach to management;
- continual improvement;
- factual approach to decision-making;
- mutually beneficial supplier relationships.

These aspects will be analysed in detail in Module 3 of this manual. According to standard ISO 9001:2000, the benefits to be obtained by enterprises implementing quality management systems include:

- improvement in the quality of the company's products and processes and the company itself;

¹ The most updated version of this standard is the ISO 9001:2008. Link: http://www.iso.org/iso/iso_catalogue/management_standards/quality_management/iso_9001_2008/guidance_on_the_documentation_requirements_of_iso_9001_2008.htm

- continual improvement of the quality of management systems;
- increased efficiency of processes through more effective organization;
- conditions for international trade;
- easier contracting of suppliers and services from other companies;
- increased customer satisfaction;
- improved internal communications and communications with customers;
- improved staff skills.

Standard ISO 9001:2000 applies to all types of enterprise, regardless of their position in the supply chain. ISO 22000 is specific to the food sector.

STANDARD ISO 22000: FOOD SAFETY MANAGEMENT SYSTEMS – REQUIREMENTS FOR ANY ORGANIZATION IN THE FOOD CHAIN

Standard ISO 22000 specifies the requirements for a food safety management system when an enterprise in the chain needs to demonstrate its ability to control safety risks relating to the foods it produces, handles, transports or markets. The standard is applicable to all companies involved in any link of the food chain that wish to implement systems to ensure the consistent supply of safe products. The standard defines the elements that are generally recognized as guaranteeing safety throughout the food chain, up to the point of sale, such as:

- **Interactive communication throughout the food chain** as an essential element for guaranteeing the identification and appropriate control of all risks relevant to food safety.
- **System management** based on the quality principles described in standard ISO 9001.
- **Prerequisite programmes and application of HACCP system principles.**

VOLUNTARY AND MANDATORY INITIATIVES IN FOOD SAFETY AND QUALITY STANDARDS

Mandatory

It is clearly the responsibility of governments to regulate food safety and some aspects of food quality in view of the need to protect consumer health and to provide information to support consumer decisions. How responsibilities for food quality and safety are organized varies from one country to the next. This involves either several agencies and ministries coordinating responsibilities or a single agency coordinating or assuming full responsibility for this subject.

The mandatory regulations of the European Union merit special mention. They began with the White Paper on Food Safety of 12 January 2000, which proposed an integrated approach throughout the food chain and a new harmonized, transparent legal framework applicable from farm to fork. Based on Regulation 178/2002, a series of regulations and directives have been approved on this matter. Of particular interest is Regulation 852/2004 on food hygiene.

This set of regulations is based on six general principles that provide a conceptual framework for all its components: (i) the food chain (they apply to all links in the

chain); (ii) risk analysis (as a tool for analysing hazards and risks to human health); (iii) prevention and precaution (any suspicion that a food is unsafe means it must be recalled from the market); (iv) transparency in the market; (v) co-responsibility of all the various actors in the chain (all links in the chain share responsibility); and (vi) traceability (as a tool for tracking everything that has happened to a suspicious food or unsafe food and rapidly recalling it from the market).

This is particularly important for agro-industrial companies that intend to develop the European market because importers are responsible for compliance with hygiene requirements, implementation of HACCP procedures and traceability. In turn, importers put pressure on actors within the chain to ensure that they are complying with these requirements, and demand that suppliers from non-European Union countries provide quality and safety guarantees through certification in accordance with private protocols.

Voluntary

There are a number of types and sources of voluntary standards. To cope with some of these standards, FAO has prepared a document entitled *Strengthening national food control systems – Guidelines to assess capacity building needs*, which explains the components of national food control systems, with examples of organizational structures implemented by various countries. In addition, FAO and the World Health Organization published jointly the document entitled *FAO/WHO guidance to governments on the application of HACCP in small and/or less developed food businesses*.

Codex Alimentarius is an international group responsible for developing food quality and safety standards. National governments use these standards as a basis for drafting their own regulations. Documents such as the *Recommended International Code of Practice – General Principles of Food Hygiene* (which includes guidelines for the application of HACCP) and the *Code of Hygienic Practice for Fresh Fruits and Vegetables* are particularly important for establishing private protocols on best practice; they can be of great value to enterprises that are starting to work with this approach.

The ISO standards that have gained the widest recognition include the ISO 9000:2000 series, in particular standard ISO 9001 relating to the quality management systems of any organization, and the ISO 14000 series, which promotes the best environmental practices and helps enterprises demonstrate positive environmental management. The main aim of standard ISO 22000 is to reinforce food safety (referred to by the ISO as ‘food security’) in order to ensure consumer protection and increase consumer confidence, promoting cooperation between agrifood industries and encouraging the harmonization of an assortment of different standards that place unnecessary stress on company management.

Compliance with international standards does not necessarily guarantee access to a specific market. Agro-industrial entrepreneurs should be aware of the quality and safety requirements demanded by the government responsible for the target market, as well as by the product’s buyers. They should also be aware of national

authorities' quality and safety requirements for exporting the product. Once these requirements are known, producers can develop strategies and plan the activities required to achieve compliance.

PRIVATE INITIATIVES FOR IMPROVING QUALITY AND SAFETY IN AGRO-INDUSTRIAL ENTERPRISES

With respect to compliance with voluntary standards, a variety of private initiatives exist for certifying the implementation of good practices, the HACCP system and/or quality and safety management systems. For example, the GlobalGAP protocol certifies good agricultural practices, but also includes components of quality management systems, such as control of raw materials and requirements for traceability, as well as some environmental considerations and aspects of workers' welfare. Standards SQF 1000 and SQF 2000 are similar.

Other initiatives certify quality attributes related not to safety but to product differentiation for consumers interested in particular attributes. This category includes fair trade, organic production and certification of origin. Section V of the FAO trainers' manual entitled *Improving the quality and safety of fresh fruits and vegetables: a practical approach* discusses the subject of private certification in greater depth.

For an enterprise wishing to implement quality improvements, the process may be guided by the answers to certain questions, such as:

- a. What is the reason for deciding to initiate the process?
 - to comply with a market requirement;
 - to differentiate the product;
 - to differentiate your company;
 - to reduce losses resulting from quality problems.
- b. What is the desired ideal situation?
- c. Is there a standard or programme that assists in achieving this objective? Which would be the most appropriate standards?
- d. How wide is the gap between the ideal situation and the company's present situation?
- e. What needs to be done to reduce or eliminate this gap?
- f. Which public and private institutional platforms are required to proceed with these measures?
- g. How will the application of these gap reduction measures affect the company's costs? What resources will be required?
- h. What are the benefits resulting from these measures?

The answers to these questions will assist entrepreneurs in preparing an action plan. Module 4 provides a detailed explanation of the steps to follow.

Exercise**COMPLETING THE CASE STUDY**

After reviewing the content of this theme and comparing it with your own experience, review your responses to the tasks listed initially and try to correct or supplement them. Link your replies to the topics that have been covered in this section.

APPLYING THE EXERCISE

Prepare a diagram (i.e. a pyramid) in which you try to establish the interrelation and complementarities between the food quality and safety management systems discussed in this theme. To facilitate the preparation of this diagram, first endeavour to complete the following table.

Feedback: [click here](#) for an example of a diagram illustrating the relationships between the programmes and systems.

Programme/System	GMP	GMP	HACCP	ISO 9001	ISO 22000
Objectives					
Point in the chain where it is applied					
General principles of the system					
Degree of interrelation among the systems					

Assessment of the theme

Complete these tasks, using additional pages as required.

- 1. Define in your own words what is meant by the ‘new approach of quality and safety management throughout the food chain’.
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- 2. From your position as an entrepreneur in the agro-industry sector, describe your responsibility for maintaining product quality and safety.
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- 3. State which tools you have available for compliance with the responsibility identified above.
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- 4. Indicate the areas of application and how the following programmes and systems would complement your efforts: GAP, GMP, GHP, HACCP, ISO 9001 and ISO 22000.
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Summary

- Food hygiene and phytosanitary requirements for marketing have been increasing at both international and national level. Quality and safety management systems are based on the assessment of risks and on their prevention and control.
- For these reasons, adjustments had to be made to production and preparation processes to enable agro-industrial producers and enterprises to ensure the quality and safety of food products, which is achieved by controlling and preventing contamination and loss of product quality at each stage of the production, processing and distribution chain. This has favoured the adoption of programmes such as GAP, GMP, GHP, HACCP systems and ISO 9001 and 2200 standards.
- **Good agricultural practices** are a set of principles, standards and technical recommendations relating to agricultural production to guarantee the production of safe foods with minimum environmental impact and fair conditions for workers.
- **The HACCP system** presents a systematic and preventive approach to the identification, prevention and control of biological, chemical and physical risks in order to guarantee food safety.
- **Standard ISO 9001** is a set of requirements for the planning, implementation and continual improvement of a quality management system within a company to ensure that its products meet customer needs and expectations and comply with legal requirements and regulations. The principles of standard ISO 9001 are as follows:
 - customer focus;
 - leadership;
 - process approach;
 - system approach to management;
 - continual improvement;
 - factual approach to decision-making;
 - mutually beneficial supplier relationships;
 - involvement of people.
- **Standard ISO 22000** specifies the requirements for a food safety management system where an enterprise in the food chain needs to demonstrate its ability to control food safety risks to ensure that the food it produces is safe at the point of consumption. The key elements are
 - interactive communication;
 - system management;
 - prerequisite programmes and HACCP principles.

Theme 2: The importance of product traceability in quality and safety management

INTRODUCTION

Product traceability has become an increasingly important requirement for the development of worldwide voluntary and mandatory food standards aimed at ensuring quality and safety. Codex Alimentarius² defines traceability as the ability to follow the movement of a food through specified stage(s) of production, processing and distribution.

In the context of a food control and certification system, traceability is a tool that can be used to protect consumer health by guaranteeing food safety and ensuring correct practices in the food trade, thereby contributing to the effectiveness and efficiency of the various integrated measures for food safety. However, a tool such as traceability is not sufficient in itself to improve results relating to food safety or to ensure the application of correct practices in the food trade. This only happens when the tool is applied in conjunction with supplementary measures and appropriate requirements. As a tool, traceability does not replace food safety measures but plays a key role in improving effectiveness and efficiency.³

This theme illustrates the importance of systems for tracking products throughout the food supply chain (from the farm to fork), as part of the overall improvement of quality and safety management.

EXPECTED RESULTS

Upon completion of this theme, participants are expected to have a better understanding of the importance of:

- using tools to ensure the traceability of products throughout the supply chain;
- product traceability as a tool to complement food quality and safety measures, improving their effectiveness and efficiency;
- adopting tools that ensure product traceability in accordance with predefined objectives, taking into account the company's technical, administrative and financial resources.

² Available at: http://www.codexalimentarius.net/download/standards/10603/CXG_060e.pdf

³ Codex Committee on Food Import and Export Inspection and Certification Systems Codex. ALINORM 06/29/30

SUPPORT MATERIALS

Case study: The importance of traceability in agro-industry

Reading for development of the theme: The importance of product traceability in the quality and safety management systems of agro-industrial enterprises

PowerPoint presentation: Theme 2

Appendix 3: Exercise on Theme 2 – Tools implemented throughout the agrifood chain to facilitate product traceability

Case study**M
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The importance of traceability in agro-industry

The problem

The processing company CONFIRICOS makes sweets and fried snacks. Recently the company faced a difficult situation after some of its products were returned because of a bad smell (rancidity) and the presence of mould. The company initiated an immediate investigation. Several samples were analysed and two lots were identified, one of candied peanuts and another of fried peanuts, both with high levels of rancidity and the presence of aflatoxins (toxic substances produced by the fungus *Aspergillus flavus*). As a result of these analyses, the company halted production and recalled all contaminated products from the market. The company reviewed its records in order to identify its main customers and to recover products that had not been marketed.

The importance of leaving a trail

With this information, specialists began tracing the product to identify the phase of the process where the contamination had occurred. It was found that the ingredients were well-known, good quality brands and that the peanuts, from Bolivia, had a quality certificate from the exporting company. Documents indicated that the analyses carried out on the oil and sugar prior to production showed values that complied with established standards. Reports on the quality of preservatives and colouring agents were reviewed and it was found that the correct controls had been carried out with satisfactory results, as was the case with the other ingredients.

During the document review, it was found that a delay of approximately 20 days had occurred in the delivery of peanuts from Bolivia owing to a labour problem on the border between Peru and Bolivia, which had held up the shipment. However, the quality testing carried out on the raw material upon arrival at the company indicated that the peanuts were of satisfactory quality. After several tests and a review of various documents, the company contacted the Bolivian supplier of the peanuts and established that the problem was associated with the storage period. The raw material was near the end of its shelf life when the company acquired it; however, it was stored for some time before being processed (10 days for the first batch and a further 12 days for the second batch). This delay allowed the minimal fungi present to multiply, producing rancidity. The high temperatures used for frying and candying increased the rancidity to the point where the final products were unfit for consumption.

Conclusion

The problem probably developed when the raw material was subjected to poor storage conditions for more than 20 days in the coastal region of Peru. Inappropriate storage conditions are often responsible for corn, nuts and other products becoming contaminated by fungi-produced toxins.

Source: based on material from a number of different companies.

CRITERIA FOR ANALYSING THE CASE

After reading the case study carefully, carry out an analysis and attempt to answer the following questions:

- Which tools did the company use to facilitate tracking of the product?
- What is the practical value of product traceability tools and how does traceability contribute to ensuring product quality and safety?
- What lessons can be learned that are applicable to your company?

At the end of Theme 2 the same questions are posed so that they can be answered based on the newly acquired knowledge.

Reading for Theme 2**M
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The importance of product traceability in the quality and safety management systems of agro-industrial enterprises

INTRODUCTION

According to Codex Alimentarius, product traceability is the ability to follow the movement of a food through specified stages of production, processing and distribution. A traceability system provides a response to unexpected and emergency situations (EAN, 2006).

In standard ISO 8402, traceability is the ability to separate a material or product into individual lots or units and to trace the history, application or location of an entity (production or operations applied to a product) by means of records.

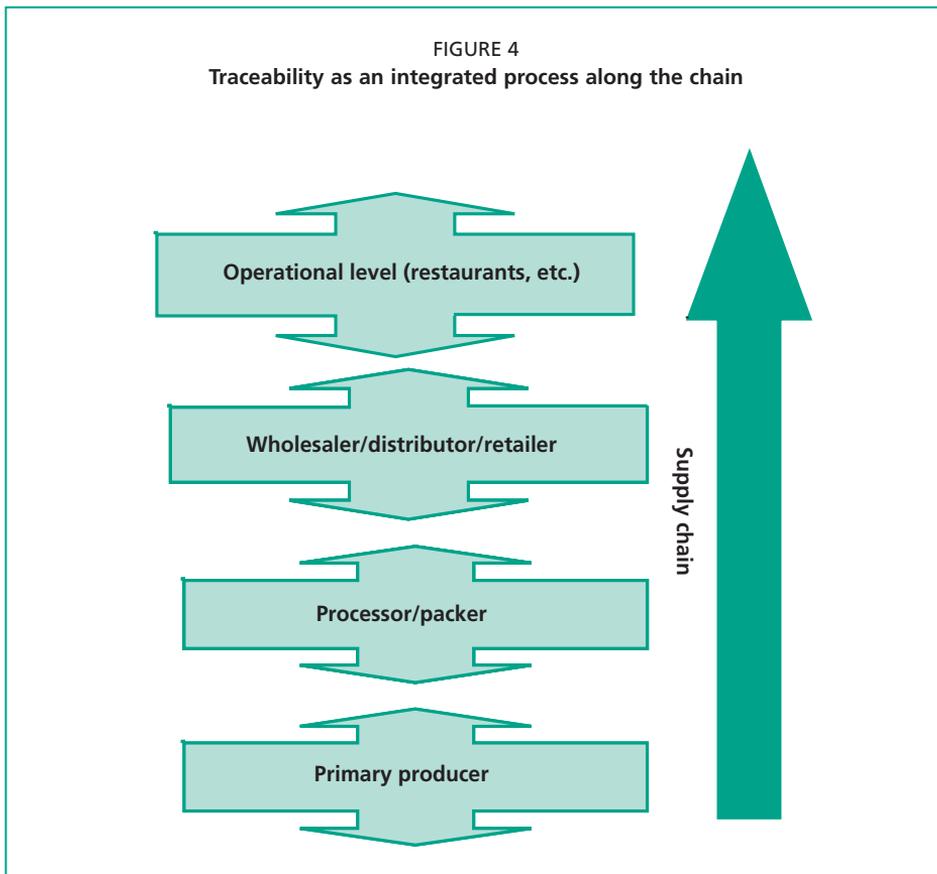
According to Article 3 of Regulation 178/2002, the European Union considers traceability to mean the ability to trace and follow a food, feed, food-producing animal or substance intended to be, or expected to be incorporated into a food or feed, through all stages of production, processing and distribution.

Standard ISO 9000 defines traceability as the ability to trace the history, application or location of anything to do with food.

Although these definitions vary in the degree of information needed to track a product, some of them include not only the location of the product but also the materials of which it was made. An essential aspect of traceability tools is that they can be applied to all links in the food chain (from production to distribution) and should be able to identify the source of the food (the previous stage) and its destination (the next stage) at any point in the chain.

Traceability is an integrated process along the entire supply chain, as illustrated in Figure 4, which helps to answer the following questions:

- How do we guarantee quality and confidence in our products?
- How can we deliver safe products to our customers and consumers?
- What has happened to our products in the supply chain?
- Where do the products come from and where will they be shipped?
- What is the lot number or other detailed information concerning the products received or shipped?
- How can we differentiate our products based on confidence in their characteristics, components, processes and channels?
- How can we reduce risks and improve safety and confidence in our products?



Source: *Fresh produce traceability: a guide to implementation*. Produce Marketing Association (PMA)/Canadian Produce Marketing Association (CPMA).

HOW CAN THE HISTORY OF A PRODUCT BE TRACED?

Traceability is divided into two main stages: (a) following the path from the product's origin until the point of final consumption and (b) identifying the product's origin from the point of final consumption back through the chain. The main objective is to ensure the supply of safe food and best trade practices. This risk-management approach may be used in the food chain but should also be employed by the company itself, as well as by producers and exporters' organizations. It should be used inside the company, within the internal supply chain, and at the global level, until the product reaches the final consumer.

Any system that is established must be comprehensible and, whenever there is a suspicion that the product could affect consumer health, it must be possible to backtrack quickly through the chain and withdraw the product from the market. Faults can occur at any stage of production, handling or transport, or at any point in the chain. There may be several reasons, such as an error in a specific processing step, an inadequate process design, a poorly implemented control system, ignorance or even intentional acts.

WHAT IS NEEDED TO TRACK A PRODUCT INSIDE OR OUTSIDE A COMPANY?

1. A specific form of product identification.
2. Information on the product.
3. A record that connects one link to the next in the chain.

ADVANTAGES OF APPLYING PRODUCT TRACEABILITY PRINCIPLES IN AGRO-INDUSTRIAL ENTERPRISES

Traceability is an information tool for tracking products along the entire chain from production to distribution. This is very useful for improving the effectiveness and efficiency of processes inside the company. In this sense, it provides support to the agro-industrial entrepreneur in:

- taking measures when a risk has been identified to facilitate the rapid removal of the food from the market, thereby minimizing any potential negative impact on consumer health, economic losses or future detrimental effects on trading, including damage to the brand image;
- improving the company's competitive position in the market by increasing consumer confidence in the product, as well as by guaranteeing the product's authenticity, the accuracy of the product information and the product characteristics (e.g. organic agriculture, animal welfare, etc.)
- managing, controlling and optimizing production processes;
- pinpointing within a group of producers marketing as a group to domestic or foreign markets: (i) where a fault occurred; (ii) which producer is responsible; (iii) how much of the product needs to be removed from the market and (iv) where the product is located.

OTHER ADVANTAGES FOR ENTERPRISES: INCREASED SECURITY AND ECONOMIC BENEFITS

The cost of making the necessary changes to ensure product traceability is offset by the potential benefits that an entrepreneur can expect from an instrument that:

- protects human life and health to a high degree;
- provides information inside the company to facilitate process control and management;
- contributes to product quality assurance and certification;
- makes it easier to pinpoint problems, halt production, and, where necessary, recall food and feed effectively;
- supports decision-making on the use of lots or units of affected products (e.g. reprocessing or rerouting of animal feed), with the resulting economic implications;
- pinpoints the source of the problem promptly. This is especially important when considering whether or not to take responsibility for the problem (which is crucial in demonstrating innocence or blame in cases of alleged public health offences or of infringements relating to the commercial

quality of products or the honesty of commercial transactions or consumer interests. It also makes it possible to take action to prevent a recurrence of the problem);

- assists in dealing with customer complaints (actors in the chain or consumers) concerning the products delivered, providing information on causes detected anywhere in the chain from their point of origin to sale to the consumer;
- increases market share by promoting the safety of food products and winning or regaining consumer trust.

ADVANTAGES FOR THE CONSUMER: INCREASED CONFIDENCE

Traceability systems reassure consumers that products have been produced with the required transparency along the entire agrifood chain, from producer to consumer.

ADVANTAGES FOR THE ADMINISTRATION: MORE EFFECTIVE INCIDENT MANAGEMENT

Traceability systems ensure that the authorities have greater confidence in food companies, which facilitates official control activities within the chain. By optimizing traceability systems in the food sector, the authorities are able to take more effective action in terms of handling food safety incidents, crises or alerts. Guidelines to the implementation of product traceability are presented below. A company may adapt them to its own characteristics and circumstances.

STEPS IN IMPLEMENTING PRODUCT TRACEABILITY TOOLS

Step 1: Define current product traceability in the company

The first step is to carry out a detailed study of the company's record-keeping practices (e.g. records for the implementation of prerequisite programmes and HACCP programmes), and then assess their contribution to tracking products. Some companies have made considerable progress in the field of product traceability.

Step 2: Communicate with suppliers and customers

Entrepreneurs must be informed about systems for tracking raw materials or products requested by customers, the target market's tracking requirements and whether there are documents and guidelines to support the application of product traceability principles.

Step 3: Define the context

Product traceability systems require information that tracks the step immediately preceding the step in which the company is involved, as well as the step immediately after. This is often termed **backward** and **forward** tracking of the product. The same applies to an agro-industrial enterprise carrying out preparation, processing, etc. In this case the company should implement internal processes to maintain the

identity of products that enter the plant and pass through the different processing stages within the company. This is known as internal traceability or process traceability.

Most agro-industrial enterprises record information on the products that enter the company and the associated suppliers. They also record how these products were used inside the company, as well as information on the products prepared and the customers to which they were delivered. The idea is that the system should contain information about each stage involved in the production, processing and distribution of the products.

Step 4: Define criteria for grouping products for traceability

In any product traceability system, all the product units that a company produces, manufactures, packages or manages must be grouped. In addition, the group must be given a unique identity. If the enterprise is in the primary sector or if it is a processing enterprise, these groups can be configured according to different criteria, such as:

- the period (hourly, daily, weekly);
- the production line;
- the farm or lot;
- the place and date.

A wide variety of **identification** systems is available, from handwritten labels to barcodes and radio frequency chips. When selecting the grouping methods for products within an enterprise, the varying degrees of precision must be considered. A balance should be found between the economic benefits of more precise groupings and the complexity and cost of working at this higher level of precision.

Step 5: Establish information systems, records and necessary documentation

The documentation for the system implemented should include a clear definition of objectives and responsibilities and a detailed description of the traceability system and its application, as well as its relationship with its customers' and suppliers' tracking systems. The information should be collected and stored as it passes through the chain, and there should be a procedure for reviewing and updating the system.

The information to be recorded includes:

- at the reception stage of raw materials – name of supplier, description of product received, quantity, location of received products and other relevant information;
- at the processing stage – how the products received were used, the mixtures, the quantities used, a description of the final product;
- at the product delivery and sale stages – information on the customer, the quantity and the characteristics of the product delivered.

Step 6: Establish mechanisms for validation or verification by the company

The system should be reviewed regularly to ensure that it is operating effectively. This can be done by checking:

- the accuracy of the information that has been collected and stored;
- the response time when a problem occurs.

The system should be reliable in terms of the accuracy of the information collected and efficient in terms of the rapid provision of information needed to solve problems.

Step 7: Establish communication mechanisms between companies

The functioning of a product traceability system throughout the chain depends on how efficiently the participants fulfil their role, on collecting information from the preceding and subsequent stages and on the ability to make this information available to the other members of the chain. The information on product traceability must be shared in order to maintain the integrity and functioning of the product supply chain.

Step 8: Establish procedures for locating, immobilizing and, where necessary, recalling products

The company must establish rapid reaction mechanisms to ensure that, when an incident occurs, it is possible to: identify the nature of the incident; take corrective measures to protect consumer health and the company's reputation; eliminate the cause of the incident and prevent its recurrence.

Step 9: Product traceability and voluntary and mandatory standards

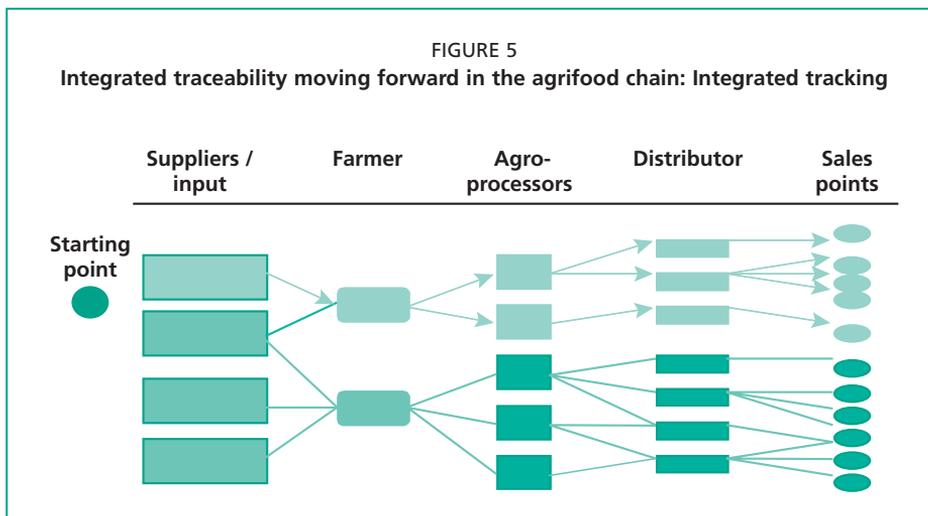
The standards approach is based on segmentation, which means that each actor involved in the chain is responsible for keeping records that identify the origin of the product and the recipient of the product in the subsequent link in the chain. Although the approach is segmented, it means that product traceability is integrated throughout the entire chain (Figure 5 and Figure 6).

In almost all food supply chains, some or all of the information required for product tracking is available from food safety and quality management programmes, such as those for prerequisite programmes and the HACCP system. It is important that this information is organized in such a way that it serves the stated objectives.

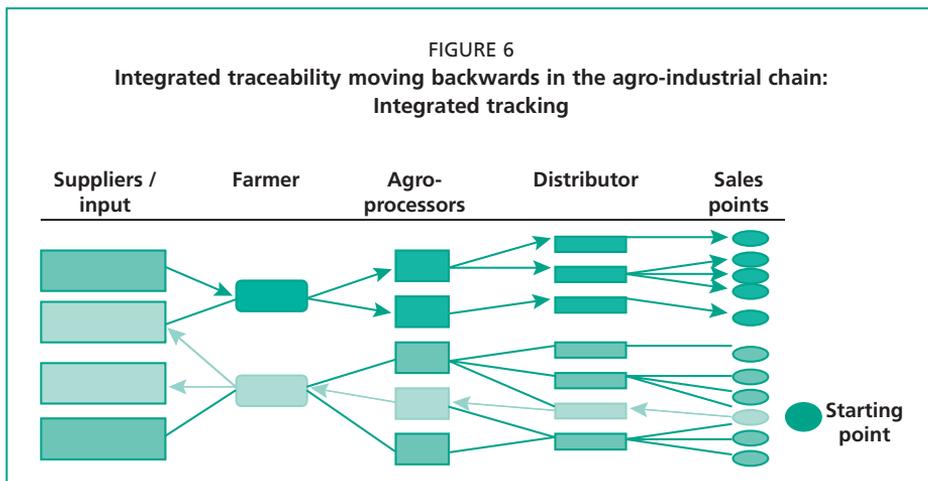
APPLICATION OF PRODUCT TRACEABILITY TOOLS IN ACCORDANCE WITH MANDATORY AND VOLUNTARY STANDARDS

Initiatives to integrate product traceability into food regulations have been led by the European Union (*EC 178/2002*), the United States of America through its bioterrorism regulations (*Bio-Terrorism Preparedness Act, 2002*) and Japan (*Food Sanitation Law in Japan. Standard Information Service, Jetro, March 2003*).

Many of the standards in private initiatives incorporate traceability as a requirement in food quality and safety management systems. In such cases



Source: *Integrated traceability moving forward in the agrifood chain – Integrated tracking*. European Article Numbering Association (EAN). Code EAN/UCC – 128, Reference Guide EAN-UCC – 14, Global users manual EAN-UCC.



Source: *Integrated traceability backwards in the agrifood chain – Integrated tracking*. European Article Numbering Association (EAN). Code EAN/UCC – 128, Reference Guide EAN-UCC – 14, Global users manual EAN-UCC.

traceability is a prerequisite and should be considered as interdisciplinary to ensure quality, safety and secure distribution. Below are some examples:

- Requirement 7.5.3 of standard **ISO 9001** on identification and traceability states that the organization must control and record the unique identification of the product.
- Section 2.13 on traceability of the global food standard of the **British Retail Consortium (BRC)**, aimed at companies supplying foods to the British market, states that the company must have a system for following products from the origin of the raw materials through to the finished product.

- The **International Food Standard (IFS)**, aimed at companies supplying foods to the French and German markets, indicates under number 4.18: “The organization shall establish and apply a traceability system that enables the identification of product lots and their relation to batches of raw materials, processing and delivery records. The traceability system shall be able to identify incoming material from the immediate suppliers and the initial distribution route of the end product.”

CONSIDERATIONS WHEN ADOPTING PRODUCT TRACEABILITY TOOLS

As a first step, each agro-industrial enterprise should define the objectives of its product traceability programme, for example: (i) to comply with a legal requirement or regulation; (ii) to satisfy a requirement of buyers in the target market and (iii) as a tool to improve company and marketing management. Based on these objectives, the entrepreneur should assess the costs and benefits of implementing the system and, on the basis of this assessment, should define whether the traceability tools will be aimed at meeting minimum requirements or whether they will also collect valuable management information. These are different approaches that entail different costs and different levels of efficiency.

The system should be geared to the company’s objectives and to its technical, administrative and financial capacity to ensure that the system can be implemented and operated effectively and efficiently.

PRODUCT TRACEABILITY APPROACHES

The minimum requirement for a company is to have a document-based traceability system for tracking the product one step back and one step forward within the chain. While electronic systems facilitate product traceability, less elaborate document-based systems can be used to collect and share all the information needed for traceability, much of which forms part of quality and safety programmes such as GAP, GMP and the HACCP system.

Some agro-industrial companies have opted to implement electronic systems of varying levels of complexity, from the simplest systems, based on data capture using barcodes, to more elaborate and costly systems using radio frequency identification (RFID). The main obstacle to the use of barcodes is that many companies use their own numbering systems and data is not synchronized with that of other actors in the chain. This makes it difficult to track the product all along the chain (PMA/CPMA, 2006). Standardized barcodes have emerged to solve this problem, as well as data synchronization systems (by product and location), combined with electronic commerce. Barcodes that define any product or standardized group of products (boxes, pallets) are used to facilitate handling, storage and shipping. International standards use Global Trade Item Number (GTIN) codes where a globally unique 14-digit number is used to identify units, products or services. GTIN⁴ is also a general term that refers to a family of data structures that comprise:

⁴ For more information on GTIN consult the web page: <http://www.gtin.info/>

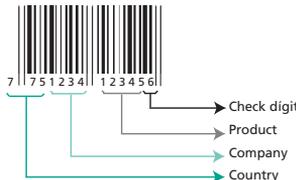
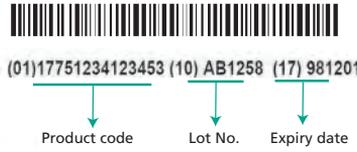
- GTIN – 12 (UPC)
- GTIN – 13 (EAN-13)
- GTIN – 14 (EAN/UCC – 128 or ITF – 14)
- GTIN – 8 (EAN-8)

Universal Product Codes (UPCs) are administered by the the United States Uniform Code Council (UCC) and the European Article Numbering Association (EAN). These are the best known families of data structures or codes, which are similar and, in practice, are being combined.

Table 2 gives an example of EAN codes and their field of application. EAN-UCC standards allow:

- the unique identification of companies in the chain;
- the unique identification of products (units of consumption);
- the unique identification of logistical units (pallets, containers);
- the unique identification of locations and processes in the chain;
- the flows of information and electronic exchange of documents.

TABLE 2
The use of barcodes in the identify different product groups

Level	Code	Application (examples)	Explanation
Point of Sale	N-13	Product	<p><i>GTIN = Global Trade Identification Number</i> <i>UCC = Universal Code Council</i></p>  <p>7 1751234 123456 </p> <p>→ Check digit → Product → Company → Country</p>
Storage and Distribution	EAN-14	Boxes	<p><i>Logical units - boxes</i></p>  <p>1 775 1234 56789 3</p> <p>↓ ↓ ↓ ↓ ↓</p> <p>Logical Country Company Product Digit variable control</p>
Logistical Applications	EAN-128	Pallets	<p><i>Logical units - variable inf.</i></p>  <p>(01)17751234123453 (10) AB1258 (17) 981201</p> <p>↓ ↓ ↓</p> <p>Product code Lot No. Expiry date</p>

The approach to be used by any agro-industrial entrepreneur to ensure effective product tracking should be based on a cost/benefit analysis of each system. Simple documentation systems, when properly applied, achieve the same objectives as more elaborate systems.

Exercise

COMPLETING THE CASE STUDY

After reviewing the content of this theme and comparing it with your own experience, review the responses to the initial questions and try to correct them or supplement them. Link your answers to the topics that have been covered in this section.

APPLYING THE EXERCISE

Improve your understanding of the principles of product traceability by carrying out the following exercise:

- Figure A3.1 in Appendix 3 gives an example of a system for tracking a product during different stages of the artichoke supply chain. Taking into account the information provided, and referring to your company's specific activities in the chain (production, processing, etc.), identify the types of document or tool currently used by your company that could become part of your product traceability system.
- Taking into account your position in the supply chain, or the interactions between processes within your own company, identify measures that you could take to improve the system to make it comply with the minimum requirements for product traceability.

Assessment of the theme

Answer these questions, using additional pages as required.

1. Is traceability a tool that can be used for quality and safety management of agro-industrial products? Explain your answer.

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2. What are the benefits to an agro-industrial company of implementing a traceability system for its products?

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3. What does it mean to be able to track products forward and backward?

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4. What does *internal traceability* mean and what is its purpose?

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5. Which constraints affect the implementation of the traceability tool in your particular company?

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Summary

- Product traceability has become an increasingly important requirement worldwide for voluntary and mandatory food standards for quality and safety management.
- According to Codex Alimentarius, product traceability is the ability to follow the movement of a food through specified stage(s) of production, processing and distribution.
- In the context of standards and codes of practice led by the public and private sectors, the interchangeable term most commonly used for product tracking is “traceability”. Traceability provides responses across all agricultural and agro-industrial processes and is particularly useful when problems or emergency situations occur.
- Traceability supports agro-industrial entrepreneurs in:
 - i. taking measures when a risk has been identified to facilitate the rapid removal of a food from the market, thereby minimizing any negative impact on the health of the consumer, economic losses and possible detrimental effects on trade, including damage to the brand image;
 - ii. improving the company’s competitive position in the market by increasing consumer confidence in the product, as well as by guaranteeing the product’s authenticity, the accuracy of the product information and the product characteristics (e.g. organic agriculture, animal welfare, etc.);
 - iii. managing and controlling the productive processes and their optimization.
- In almost all food supply chains, some or all the information required for product tracking is available from food safety and quality management programmes, such as those for prerequisite programmes and the HACCP system. It is important to organize the information in such a way that it serves the stated objectives.
- There are different approaches to product traceability that entail different costs and different levels of efficiency. The chosen system should be geared to the company’s objectives and its technical, administrative and financial capacity to ensure that the system can be implemented and operated effectively and efficiently.

References

THEME 1

- Codex Alimentarius.** 2003. *Recommended international code of practice: general principles of food hygiene* CAC/RCP 1 – 1969, Rev. 4. 2003. (available at ftp://ftp.fao.org/codex/Publications/Booklets/Hygiene/FoodHygiene_2003e.pdf)
- FAO.** 2002. *Food quality and safety systems: a training manual on food hygiene and the hazard analysis and critical control point (HACCP) system*. Rome.
- FAO.** 2003. *Development of a framework for good agricultural practices*, Committee on Agriculture (Seventeenth Session). 21 March–4 April (available at http://www.fao.org/ag/agn/CDfruits_es/others/docs/bpa.doc)
- FAO.** 2004. *Improving the quality and safety of fresh fruits and vegetables: a practical approach*. Manual for trainers (available at http://www.fao.org/ag/agn/agns/foodproducts_fresh_en.asp)
- FAO.** 2006. *Integrated food control systems* (available at http://www.fao.org/ag/agn/agns/foodcontrol_en.asp)
- FAO/WHO.** 2003. *Assuring food safety and quality: guidelines for strengthening national food control systems* (available at <http://www.fao.org/docrep/006/y8705e/y8705e00.htm>)
- ISO.** 2000. ISO 9000 international standard certified translation. *Quality management systems: concepts and vocabulary*. ISO 2000.
- UNIT.** 2001. *Quality management systems ISO 9000*. Uruguayan Institute of Technical Standards. Uruguay.

THEME 2

- Araya, E.** 2004. *Traceability: concepts and bases for defining a standard for the Chilean export fruit industry*. Presentation at the Seminar on Traceability, Santiago, April 2004.
- CIES.** 2004. The Food Business Forum. *Implementing traceability in the food supply chain* (available at <http://www.ciesnet.com>)
- Codex.** 2006. Codex Committee on Food Import and Export Inspection and Certification Systems Codex. ALINORM 06/29/30 (available at <http://www.codexalimentarius.net/web/archives.jsp?lang=en>)
- Codex.** 2006. *Report of the Codex Alimentarius Commission*. Twenty-ninth session (available at <http://www.codexalimentarius.net/web/archives.jsp?lang=en>)
- PMA/CPMA.** 2006. *Fresh produce traceability: a guide to implementation*. Second version. Produce Marketing Association (PMA) and the Canadian Produce Marketing Association (CPMA) (available at <http://www.pma.com/>).
Web page of the Global Trade Identification Number: <http://www.gtin.info/>

Appendix 1

Recommended further reading on Module 2 themes

THEME 1: FOOD QUALITY AND SAFETY MANAGEMENT IN AGRO-INDUSTRY

Reading 1: Improving the quality and safety of fresh fruits and vegetables: a practical approach. Manual for trainers

Author: Piñeiro, M. and Díaz, L.

Publisher: FAO

Year: 2004.

Manual:

http://www.fao.org/ag/agn/agns/foodproducts_fresh_en.asp

Description

We recommend reading Modules 4 and 5 of this manual, which is aimed at the practical application of technical knowledge for the implementation of quality and safety assurance of fresh fruits and vegetables in the business context, at local, regional, national and governmental levels in each country.

Reading 2: Manual on food hygiene and on the hazard analysis and critical control points (HACCP) system

Author: FAO

Publisher: FAO

Year: 2004.

Manual:

http://www.fao.org/ag/agn/CDfruits_en/others/docs/sistema.pdf

Description

Chapter 2 of this manual is recommended for those interested in the application of the GMP programmes, while Chapter 3 is more appropriate for who want to know more about HACCP.

Reading 3: Development of a framework for good agricultural practices (GAP)

Author: FAO. Committee on Agriculture (Seventeenth Session)

Publisher: FAO

Year: 2003.

Document:

http://www.fao.org/ag/agn/CDfruits_en/others/docs/bpa.doc

Description

This document is recommended for those interested in the basic principles and components of GAP. The document describes the context and the approach of GAP in food safety and in all the stages of the food chain and examines the current applications of GAP by the public and private sectors, civil society and farmers. The document includes a proposal for developing a framework of principles and generic and practical indicators to guide debate and for the preparation of GAP guidelines for agricultural production and all the subsequent stages of the chain.

Reading 4: Code of hygienic practice for fresh fruits and vegetables – Codex Alimentarius

Author: Codex Alimentarius

Publisher: Codex Alimentarius

Document:

http://www.codexalimentarius.net/download/standards/10200/CXP_053e.pdf

Description

This document is suggested for those who are interested in reducing microbial contamination in primary production. The code deals with good agricultural practices and good manufacturing practices, which help to control the risks – microbiological, chemical and physical – associated with the entire production stage of fresh fruits and vegetables from primary production to packing.

Reading 5: Guide to minimize microbiological risk in fresh fruits and vegetables

Author: Center for the Control and Prevention of Disease, Food and Drug Administration (FDA), United States of America

Publisher: FDA

Document:

<http://www.fda.gov/Food/GuidanceComplianceRegulatoryInformation/GuidanceDocuments/ProduceandPlanProducts/ucm064574.htm>

Description

This guide is recommended for those interested in guidelines covering the safety of fresh products in the United States of America. These guidelines provide some basic principles and practices, which are recommended for operators to minimize any microbiological risk in the production, packing and transport of fruits and vegetables.

Reading 6: Assuring food quality and safety: back to the basics – quality control throughout the food chain

Author: Abalaka, J.A.

Publisher: FAO, Conference on International Food Trade Beyond 2000. Science-based decisions, harmonization, equivalence and mutual recognition.

Year: 1999.

Document:

<http://www.fao.org/docrep/meeting/X2669E.htm>

Description

Full reading of this article is recommended in order to improve understanding of the role of governments in ensuring food quality and safety.

THEME 2: IMPORTANCE OF PRODUCT TRACEABILITY IN FOOD QUALITY AND SAFETY MANAGEMENT**Reading 1: Traceability for fresh fruit and vegetables – Implementation guide**

Author: GS1

Publisher: GS1

Year: 2009.

Document:

http://www.gs1.org/sites/default/files/docs/gsmpt/traceability/Global_Traceability_Implementation_Fresh_%20Fruit_Veg_i1.pdf

Description

Guidelines to how GS1 traceability solutions work in practice and how to implement the GS1 Traceability Standard.

Reading 2: The complete barcode guide

Author: Polylabel.com – Cressman Consultants Limited

Publisher: Polylabel.com – Cressman Consultants Limited

Document:

<http://www.polylabel.com/barcodes/barcodeguide.php>

Description

This guide will provide you with information regarding barcodes, the different barcode label symbologies and their specifications and a glossary of common terms relating to bar coding. There is also a section that discusses checkdigit (a barcode generator to allow you to generate barcode images) and, last but not least, a simple user asset management software utility.

OTHER LINKS OF INTEREST FOR MODULE 2**Fresh fruit and vegetable quality and safety database**

Author: FAO

Publisher: FAO

Year: 2004.

Database:

<http://www.fao.org/ag/agn/fv/ffvqs?m=catalogue&i=FFVQS&p=nav&lang=en>

Description

The database contains about 800 references relating to the quality and safety of fruits and vegetables, including laws, regulations, standards, codes of practice and training materials.

Generic standards for small producers' organizations

Document:

<http://www.fairtrade.net/standards.html?&L=0>

Euro-Retailer Produce Working Group (EUREP)

Document:

<http://www.eurepgap.org/fruit/Languages/English/documents.html?Lang=English>

Portal GS1

Presents guidelines for the application of traceability in various sectors, using case studies.

Document:

<http://www.gs1.org/productssolutions/traceability/implementation/>

Traceability implementation in developing countries, its possibilities and its constraints. A few case studies

Author: FAO

Publisher: FAO

Year: 2005.

Document:

http://www.fao.org/ag/agn/food/control_essaytrace_en.stm

Description

Presents interesting case studies relating to the application of traceability systems.

Food and Drug Administration of the United States of America (FDA) – The Bioterrorism Act of 2002. Maintenance of Records

Document:

<http://www.fda.gov/oc/bioterrorism/bioact.html>

Food Safety: From the Farm to the Fork. European Union site

Document:

http://www.ec.europa.eu/food/index_en.htm

Appendix 2

Information on quality and safety standards and regulations in Central America, the United States of America and Europe

CENTRAL AMERICA

Standards and regulations of the Central American Customs Union.

Information is provided on the technical regulations for approved foods or for those that are undergoing public consultations and have coverage in the Central America region.

<http://www.reglatec.go.cr/prUAPublica.htm>

Central American Technical Regulation – Processed food and beverage industry. Good manufacturing practices. General principles.

This regulation came into force in April 2006. Its objective is to establish the general rules on hygiene and operational practices during the processing of food products in order to ensure the safety and quality of foods. These rules will be applied to every food industry that operates and distributes its products within the Central American countries. Excluded from this regulation are operations dedicated to the cultivation of fruits and vegetables, the raising and slaughtering of animals, storage of foods outside of the factory, and food service to the public or to retailers, all of which are governed by other sanitary regulations.

Signatories: Costa Rica, El Salvador, Guatemala, Honduras and Nicaragua.

International Regional Organization for Plant and Animal Health (OIRSA)

Members of OIRSA are Belize, Costa Rica, El Salvador, Guatemala, Honduras, México, Nicaragua and Panama. This agency is responsible for integration in the areas of animal and plant health and has recently begun to work in the area of food safety. The web page provides information on regulations for importing and exporting plant and animal materials, as well as documents and publications on good practices.

<http://www.oirsa.org/>

Regional Portal on Food Safety, Animal and Plant Health – PRISA

This portal facilitates trade in food and agricultural products and supports the execution of the Agreement on Sanitary and Phytosanitary measures (SPS), thereby providing a single access point for national standards and regulations in the Latin American and Caribbean region relating to food safety and plant and animal health.

<http://prisa.fao.org/Es/default.jsp>

Msfinfo.com – Sanitary and phytosanitary measures for fruits and vegetables

This site provides a series of links with specific information related to the topic of food safety. It gives access to home pages for government organizations, international agencies, non-governmental organizations and local governments. It also includes materials relevant to good agricultural practice and good manufacturing practice in the fruit and vegetable sector.

<http://msfinfo.com/index.php>

COSTA RICA**International portal on Food Safety, Animal and Plant Health – Information on Costa Rica**

This link includes information on standards relating to food safety, animal and plant health in Costa Rica.

<http://www.ipfsaph.org/id/cthttpwwwfaoorgaosipsaphgeographycr?language=en>

GUATEMALA**International portal on Food Safety, Animal and Plant Health – Information on Guatemala**

This link includes information on standards relating to food safety, animal and plant health in Guatemala.

<http://www.ipfsaph.org/id/cthttpwwwfaoorgaosipsaphgeographygt?language=en>

EL SALVADOR**Centro de información de normas y reglamentos técnicos, certificación y metrología**

This site provides information on food regulations and standards.

<http://www.infoq.org.sv/>

Extensive work has been carried out on the harmonization of national standards with the standards of the Codex Alimentarius; these standards include the following:

- **Agreement 687 – NSR 67.00.283:99** on directions for the application of the hazard analysis and critical control points system (HACCP).
- **Agreement 402 – NSO 67.10.01:03** on the labelling of prepacked foods.
- **Agreement 679 – NSR 67.00.278:99** on practices for the packing and transport of fresh tropical fruits and vegetables.

- **Agreement 216** – Technical sanitary standards for the authorization and control of food establishments.
- **Agreement 789 – NSR 67.00.241:99** on codes of practice on general principles of food hygiene.

International portal on Food Safety, Animal and Plant Health – Information on El Salvador

This link includes information on standards relating to food safety, animal and plant health in El Salvador:

<http://www.ipfsaph.org/id/cthttpwwwfaoorgaosipfsaphgeographysv?language=en>

NICARAGUA

International portal on Food Safety, Animal and Plant Health – Information on Nicaragua

This link includes information on standards relating to food safety as well as to animal and plant health in Nicaragua:

<http://www.ipfsaph.org/id/cthttpwwwfaoorgaosipfsaphgeographyni?language=en>

- **NTN 11 004-02** on basic requirements for the safety of products and subproducts of vegetable origin.
- **NTN 03 026-99** on sanitary requirements for food handling.

HONDURAS

International portal on Food Safety, Animal and Plant Health – Information on Honduras

This link includes information on standards relating to food safety, animal and plant health in Honduras.

<http://www.ipfsaph.org/id/cthttpwwwfaoorgaosipfsaphgeographyhn?language=en>

MEXICO

Secretary of Economy – Catalogue of Official Standards

The Ministry of the Economy is responsible for codifying official Mexican standards (NOM) by subject, and for maintaining the inventory and collection of standards, including reference standards and international standards. This link provides access to the official standards catalogue in Mexico, including those for the food sector.

<http://www.economia.gob.mx/?P=144>

International portal on Food Safety, Animal and Plant Health – Information on Mexico

This link includes information on standards relating to food safety, animal and plant health in Mexico.

<http://www.ipfsaph.org/id/cthttpwwwfaoorgaosipfsaphgeographymx?language=en>

DOMINICAN REPUBLIC**International portal on Food Safety, Animal and Plant Health – Information on República Dominicana**

This link includes information on standards relating to food safety, animal and plant health in the Dominican Republic.

<http://www.ipfsaph.org/id/cthttpwwwfaoorgaosipfsaphgeographydo?language=en>

PANAMA**International portal on Food Safety, Animal and Plant Health – Information on Panama**

This link includes information on standards relating to food safety, animal and plant health in Panama.

<http://www.ipfsaph.org/id/cthttpwwwfaoorgaosipfsaphgeographypa?language=en>

CUBA**International portal on Food Safety, Animal and Plant Health – Information on Cuba**

This link includes information on standards relating to food safety, animal and plant health in Cuba.

<http://www.ipfsaph.org/id/cthttpwwwfaoorgaosipfsaphgeographycu?language=en>

UNITED STATES OF AMERICA**American National Standards Institute**

As the voice of the United States standards and conformity assessment system, the American National Standards Institute (ANSI) empowers its members and constituents to strengthen the United States marketplace position in the global economy while helping to assure the safety and health of consumers and the protection of the environment. The institute oversees the creation, promulgation and use of thousands of norms and guidelines that directly impact businesses in nearly every sector: from acoustical devices to construction equipment, from dairy and livestock production to energy distribution, and many more.

<http://www.ansi.org/>

Food and Drug Administration (FDA)

The United States Food and Drug Administration (FDA) is an agency within the Department of Health and Human Services and consists of centres and offices, which are listed in menu at left. The FDA is responsible for protecting public health by assuring the safety, efficacy, and security of human and veterinary drugs, biological products, medical devices, the nation's food supply, cosmetics, and products that emit radiation. The FDA is also responsible for advancing the public health by helping to speed innovations that make medicines and foods more effective, safer, and more affordable; and helping the public get accurate, science-based information in order to use medicines and foods to improve their health.

<http://www.fda.gov/>

Gateway to Food Safety Information

FoodSafety.gov is the gateway to food safety information provided by government agencies. The Federal Government of the United States of America enhances www.foodsafety.gov to better communicate information to the public and include an improved individual alert system allowing consumers to receive food safety information, such as notification of recalls.

<http://www.foodsafety.gov/>

United States Department of Agriculture (USDA)

The United States Department of Agriculture (USDA) provides leadership on food, agriculture, natural resources and related issues based on sound public policy, the best available science and efficient management. It has created a strategic plan to implement its vision. The framework of this plan depends on these key activities: expanding markets for agricultural products and supporting international economic development; furthering the development of alternative markets for agricultural products and activities; providing financing needed to help expand job opportunities and to improve housing, utilities and infrastructure in rural America; enhancing food safety by taking steps to reduce the prevalence of food-borne hazards from farm to fork; improving nutrition and health by providing food assistance and nutrition education and promotion; and managing and protecting America's public and private lands working cooperatively with other levels of government and the private sector.

<http://www.usda.gov/wps/portal/usdahome>

USDA Food Safety and Inspection Service

The Food Safety and Inspection Service (FSIS) is the public health agency in the United States Department of Agriculture responsible for ensuring that the nation's commercial supply of meat, poultry, and egg products is safe, wholesome, and correctly labelled and packaged.

<http://www.fsis.usda.gov/>

EUROPE

British Retail Consortium

The British Retail Consortium is the lead trade association representing the whole range of retailers, from the large multiples and department stores through to independents, selling a wide selection of products through centre-of-town, out-of-town, rural and virtual stores.

<http://www.brc.org.uk/>

British Standards Institution

BSI British Standards is the United Kingdom's national standards organization that produces standards and information products that promote and share best practice. It serves the interests of a wide range of industry sectors as well as

governments, consumers, employees and society overall, to make sure that British, European and international standards are useful, relevant and authoritative.

<http://www.standarduk.com>

EU Directorate General for Health and Consumers

The Directorate General for Health and Consumers has the task of keeping related laws up to date. It is the national, regional or even local governments in the European Union (EU) countries that actually apply the EU's health and consumer protection laws. It is their job to make sure traders, manufacturers and food producers in their countries observe the rules. Nonetheless, part of the job of the Directorate is to check that this is really happening and that the rules are being applied properly in all EU countries.

http://ec.europa.eu/dgs/health_consumer/index_en.htm

EU Export Helpdesk for Developing Countries

The Export Helpdesk is an online service provided by the European Commission to facilitate market access for developing countries to the European Union. The European Union is the world's largest single market and by far the most important trading partner for developing countries. The wide range of preferential and bilateral trade agreements that the EU is offering partners in the developing world allows them to benefit from more open access to the EU market. This degree of openness is unmatched by any other major economy and demonstrates the EU's commitment to putting trade at the service of development, not only in theory, but also in practice.

http://exporthelp.europa.eu/index_en.html

European Food Safety Authority (EFSA)

The European Food Safety Authority (EFSA) is the keystone of European Union risk assessment regarding food and feed safety. In close collaboration with national authorities, and in open consultation with its stakeholders, EFSA provides independent scientific advice and clear communication on existing and emerging risks. EFSA's role is to assess and communicate on all risks associated with the food chain. Because EFSA's advice serves to inform on the policies and decisions of risk managers, a large part of EFSA's work is undertaken in response to specific requests for scientific advice. Requests for scientific assessments are received from the European Commission, the European Parliament and the EU Member States. EFSA also undertakes scientific work on its own initiative, so-called self-tasking.

http://www.efsa.europa.eu/EFSA/efsa_locale-1178620753812_home.htm

EU Food Safety – From the Farm to the Fork

The aims of the programme are to:

- assure effective control systems and assess compliance with EU standards in the food safety and quality, animal health, animal welfare, animal nutrition

and plant health sectors within the EU and in third countries in relation to their exports to the EU;

- manage international relations with third countries and international organizations concerning food safety, animal health, animal welfare, animal nutrition and plant health;
- manage relations with the European Food Safety Authority (EFSA) and ensure science-based risk management.

http://ec.europa.eu/food/index_en.htm

EU Legislaton (EUR-Lex)

EUR-Lex provides direct free access to European Union law. Here you can consult the Official Journal of the European Union as well as the treaties, legislation, case law and legislative proposals. You can also use the extensive search facilities available on EUR-Lex.

You can read about EU law, legislative procedures and EU institutions. You can also consult the selection of new documents on the home page, or consult the thematic files.

EUR-Lex also offers links to the budget of the European Union, the institutions' registers and other documentation and information sources.

<http://eur-lex.europa.eu/en/index.htm>

GlobalGAP

The challenge of globalizing markets is nowhere greater than in the primary food sector. GLOBALGAP (formerly known as EUREPGAP) has established itself as a key reference for good agricultural practices in the global marketplace by translating consumer requirements into agricultural production in a rapidly growing list of countries – currently more than 80.

www.globalgap.org

UNECE Standards

At the United Nations Economic Commission for Europe (UNECE) global agricultural quality standards are developed to facilitate international trade. The standards encourage high-quality production, improve profitability and protect consumer interests. UNECE standards are used internationally by governments, producers, traders, importers, exporters and international organizations.

They cover a wide spectrum of agricultural products: fresh fruit and vegetables (FFV), dry and dried produce (DDP), seed potatoes, meat, cut flowers, eggs and egg products.

<http://www.unece.org/trade/agr/welcome.htm>

INTERNATIONAL ORGANIZATIONS

Codex Alimentarius

The Codex Alimentarius Commission was created in 1963 by FAO and WHO to develop food standards, guidelines and related texts such as codes of practice

under the Joint FAO/WHO Food Standards Programme. The main purposes of this programme are protecting the health of consumers and ensuring fair trade practices in the food trade, as well as promoting coordination of all food standards work undertaken by international governmental and non-governmental organizations.

www.codexalimentarius.net

International Organization for Standardization (ISO)

The International Organization for Standardization (ISO) is the world's largest developer and publisher of International Standards. ISO is a network of the national standards institutes of 162 countries, one member per country, with a Central Secretariat in Geneva, Switzerland, that coordinates the system. It is a non-governmental organization that forms a bridge between the public and private sectors. Many of its member institutes are part of the governmental structure of their countries or are mandated by their governments. On the other hand, other members have their roots uniquely in the private sector, having been formed by national partnerships of industry associations.

www.iso.org

Safe Food International

Safe Food International (SFI) is a project designed by and for consumer organizations that want to improve food safety on a global scale. SFI aims to unify and focus the efforts of consumer organizations worldwide that are working to ensure a safer food supply by ensuring that their national food safety programmes address common food safety problems, approve foods before they are consumed or exported to other countries, and deter the use of food as a target of intentional contamination.

www.safefoodinternational.org

Standards and Trade Development Facility

The Standards and Trade Development Facility (STDF) is a joint initiative in capacity building and technical cooperation aimed at raising awareness on the importance of sanitary and phytosanitary (SPS) issues, increasing coordination in the provision of SPS-related assistance, and mobilizing resources to assist developing countries in enhancing their capacity to meet SPS standards.

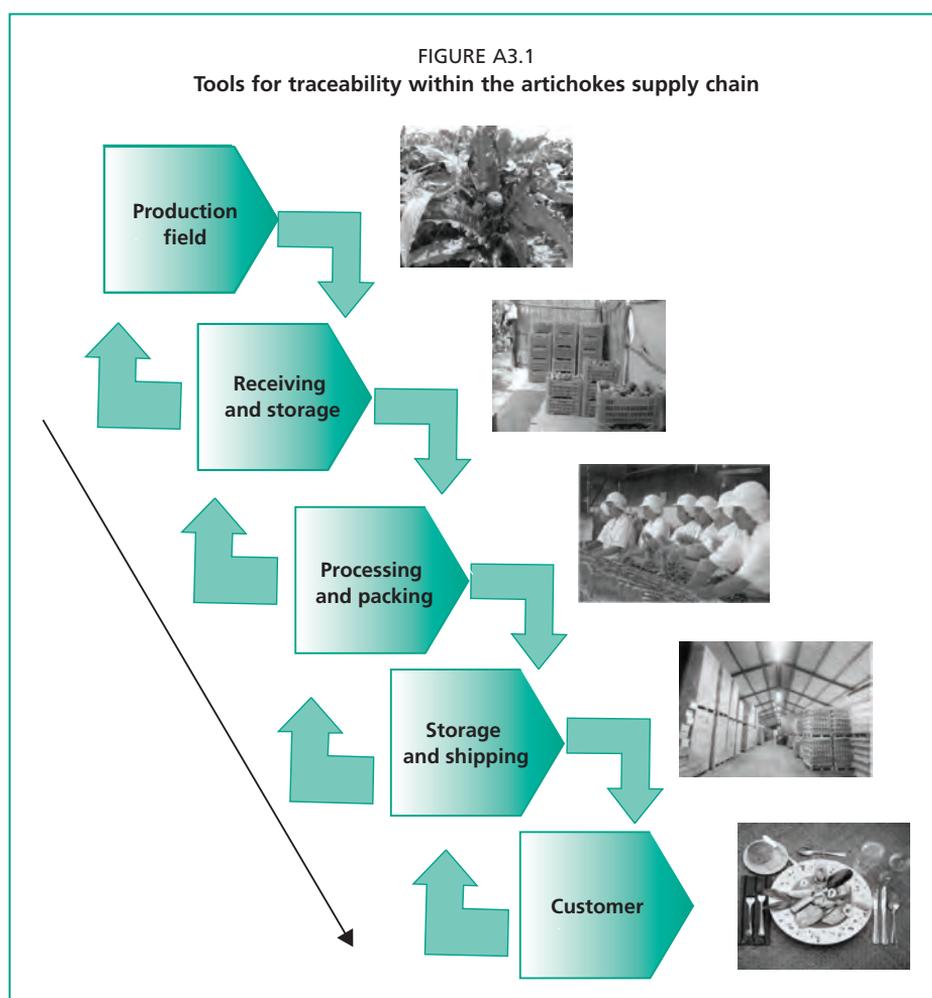
www.standardsfacility.org

Appendix 3

Exercise on Theme 2

TOOLS IMPLEMENTED WITHIN THE AGRIFOOD CHAIN TO FACILITATE PRODUCT TRACEABILITY

Apply the topics covered in Theme 2 by preparing a diagram similar to the one in Figure A3.1 for your company's activities. As part of this process, identify the tools/documents currently used by your company that could become part of a traceability system for your company's products (Figure A3.2). In addition,



identify measures that could be taken to improve the current system to make it comply with the minimal requirements for tracking the product one step backward and one step forward in the chain (Figures A3.3, A3.4, A3.5).

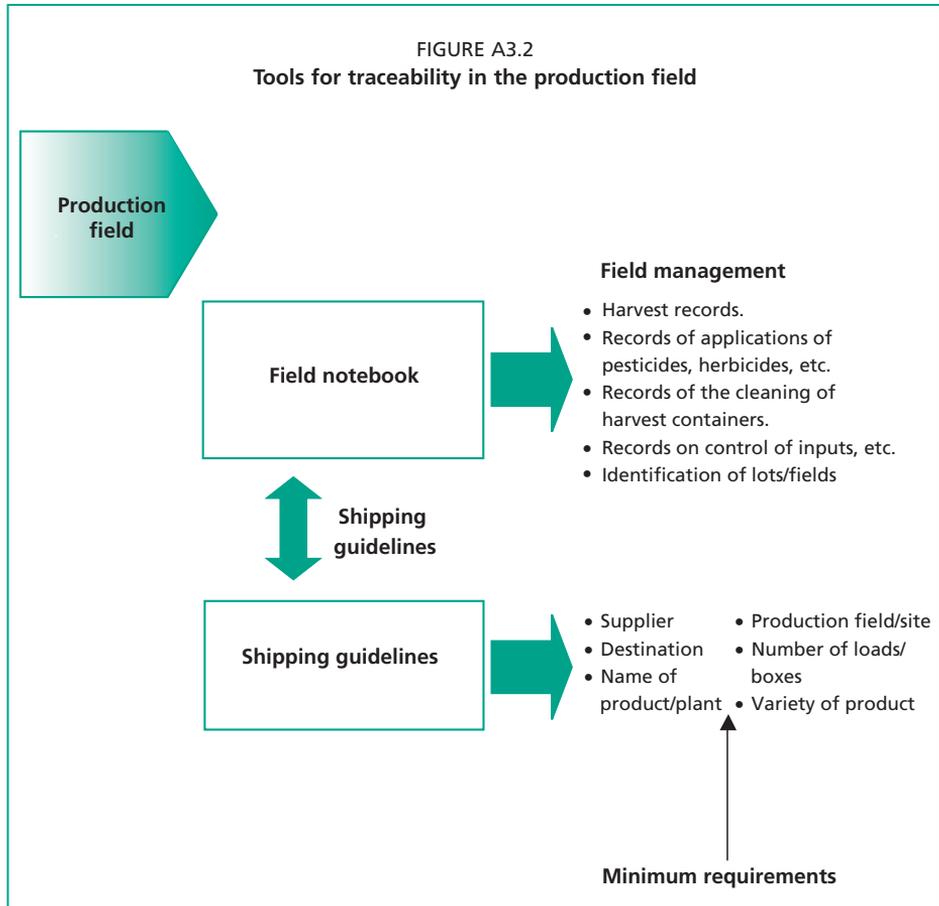
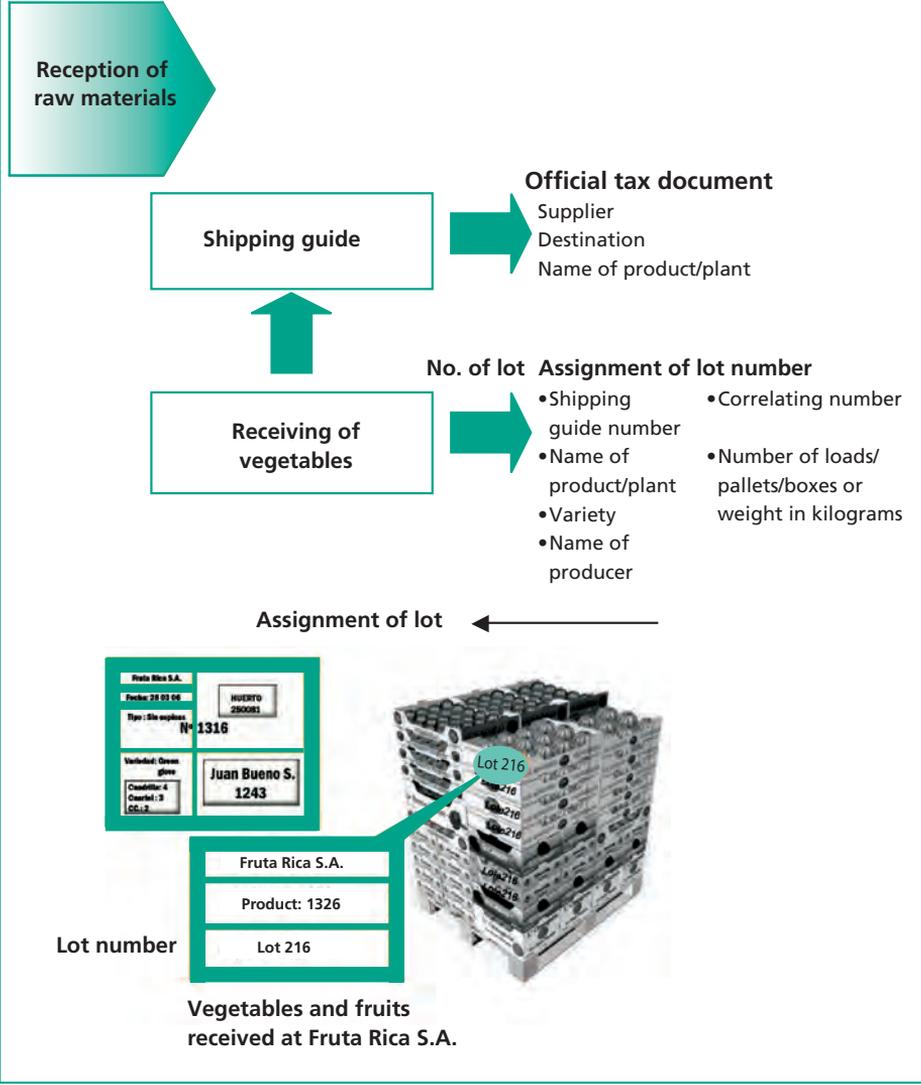


FIGURE A3.3

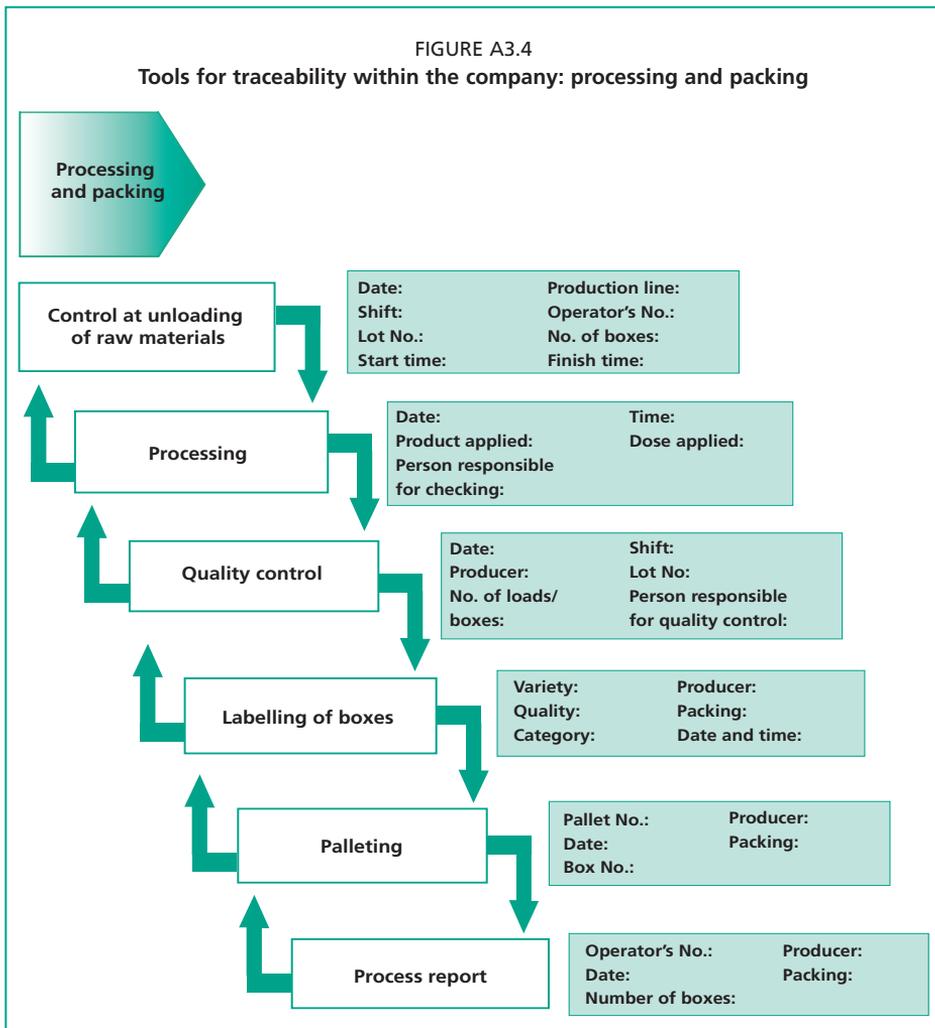
Tools for tracking within the company: reception of raw materials from lots or farms

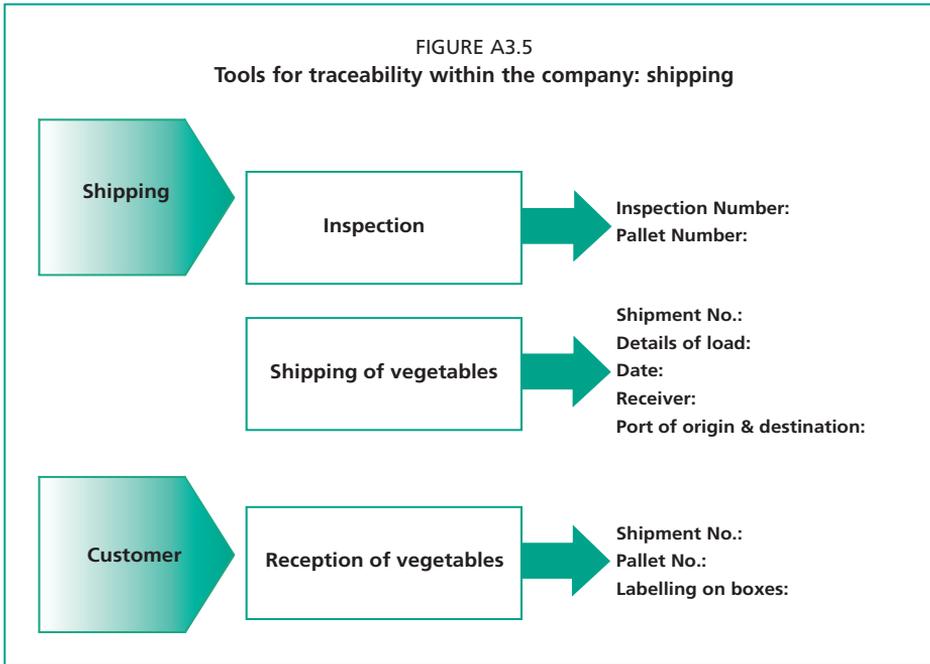


MODULE 2

SUPPLIER

Representative:		Customer details:			
N° of loads/boxes:					
Shipping mode:					
Point of delivery:					
Date:		Shipping note N°:		Order N°:	
Code	Quantity	Description	Unit price	Department	Total cost
Signature and Name:		Observations:		Accompanying documents	
Received by:					
Transport:					





Cost-effective management tools for ensuring food quality and safety

FOR SMALL AND MEDIUM AGRO-INDUSTRIAL ENTERPRISES

The purpose of this manual is to improve and build the capacities of small and medium agro-industrial enterprises in order to guarantee the quality and safety of food products. The approach integrates the different factors that affect the capacity of a business to produce foods to meet market expectations and recognized standards, while maintaining and increasing the profitability and life of the business. Management and technical aspects are integrated through a practical and cost-effective approach.

The manual includes four modules on the following subjects: the use of market information for improving quality management; systems and tools for improving quality and safety management in agro-industry; the application of quality management principles in small and medium agro-industrial enterprises; planning as a tool for improving quality and safety management.

The manual contains case studies, exercises and bibliographic references, as well as a trainers' guide, PowerPoint presentations (on CD-ROM), appendices with further reading, links of interest and a glossary. The manual aims to assist trainers and entrepreneurs wishing to use the material for self-learning. With this manual, the Food and Agriculture Organization of the United Nations (FAO) provides the small and medium agro-industry sector in developing countries with an important tool for improving competitiveness and the capacity to deliver high-quality products to consumers.

Module 2: Systems and tools for improving quality and safety management in agro-industries

Cost-effective management tools for ensuring food quality and safety

FOR SMALL AND MEDIUM AGRO-INDUSTRIAL ENTERPRISES



Module 3: Application of quality management principles in small and medium agro-industrial enterprises



Cost-effective management tools for ensuring food quality and safety

FOR SMALL AND MEDIUM AGRO-INDUSTRIAL ENTERPRISES

Module 3: Application of quality management principles in small and medium agro-industrial enterprises

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Foreword

The Rural Infrastructure and Agro-Industries Division (AGS) of FAO works to improve and strengthen the capacities of small and medium agro-industries, the enterprises that provide them with services and materials and the relevant support organizations in order to ensure food quality and safety. It carries out these activities using an approach that integrates the different factors affecting the capacity of a business to produce foods to meet the demands of the market according to recognized standards, while maintaining and increasing the profitability and viability of the business. Management and technical aspects must be integrated within a practical and cost-effective approach. This ensures that higher incomes, sources of jobs and the food security of the rural population are also promoted.

The training manual entitled *Cost-effective management tools for ensuring food quality and safety – for small and medium agro-industrial enterprises* focuses on these objectives.

This manual is the result of a collaborative effort by technical staff of the Rural Infrastructure and Agro-Industries Division of FAO. It is based on case studies carried out in Bolivia and El Salvador on opportunities for the improvement of capacity of small- and medium-scale food processing enterprises, through training to meet the demands of the market.

These case studies, which were carried out as part of the FAO programme ‘Agribusiness Development: Small and Medium Post-production Enterprises’, identified the training needs of small and medium fruit and vegetable agro-industries. This sector had been chosen as representative of the food industries operating in Latin America.

In Bolivia, a range of agro-industries was evaluated. These produced: (i) processed dried fruits, jams and/or fruit pulps, particularly pineapple and peaches; (ii) processed vegetables such as faba beans and garlic; (iii) various processed products such as pickles.

In El Salvador, the study focused on the development of products such as tomato-based foods, fruit juices and nectars (including peaches, apples, grapes and tropical fruits), as well as other fruit and vegetable products. This made it possible to identify problems common to the different enterprises, such as low-quality raw materials, inefficient processing operations, lack of knowledge of the relevant quality and safety standards and their implementation and lack of entrepreneurial vision. There was a consensus among small-scale entrepreneurs that these problems could be overcome by implementing innovative training strategies. This consensus led to the idea of preparing this manual.

The manual is divided into four modules, each subdivided into themes. Module 1 discusses the use of market information as a tool for business decision-making. Module 2 covers systems and tools for improving the management of food quality and safety in agro-industry. Module 3 focuses on the principles of quality

management in small and medium agro-industrial enterprises. Module 4 discusses planning as a tool for the management of food quality and safety.

This manual includes case studies, exercises and bibliographic references, as well as a trainer's guide, PowerPoint presentations, appendices, further reading and links of interest.

The purpose of this manual is to assist trainers and entrepreneurs wishing to use the material for self-learning. With this manual, FAO can now provide the small and medium agro-industry sector in developing countries with an important tool for improving its competitiveness and its capacity to deliver high-quality products to consumers.

The English version has been revised to include references, recommended reading and links suitable for English readers. In Module 2, information on standards and regulations relating to quality and safety has been included in order to provide norms that are relevant worldwide.

Geoffrey C. Mrema

Director

Rural Infrastructure and Agro-Industries Division

Acronyms and abbreviations

Brix	measurement of the amount of sugar in a solution per weight of total solution
GAP	good agricultural practices
GLOBALGAP	pre-farm-gate standard for good agricultural practice (formerly known as EUREPGAP)
GMP	good manufacturing practices
HACCP	hazard analysis and critical control points
ISO 22000	ISO standard on food safety management systems
ISO 9000	family of ISO standards on good quality management practices
ISO 9000:2000 series	ISO 9000 family of standards issued in 2000
ISO 9001	ISO standard providing a set of standardized requirements for a quality management system
ISO 9001:2000	ISO 9001 standard issued in 2000
ISO	International Organization for Standardization
NGO	non-governmental organization
PDCA	planning, doing, checking and acting
SCM	supply chain management
SENA	Colombia's National Training Service
Six 'M's	manpower, materials, machinery, method, medium and measurement

Study guide for the module

APPLICATION OF QUALITY MANAGEMENT PRINCIPLES IN SMALL AND MEDIUM AGRO-INDUSTRIAL ENTERPRISES

Objectives

- To illustrate the importance of quality management principles for improving product quality and safety
- To provide guidelines for the application of quality principles in small and medium agro-industrial enterprises

Content

Theme 1: Principles of quality management in small and medium agro-industrial enterprises

- General quality management principles

Theme 2: Leadership, the key to improving food quality and safety

- Entrepreneurial leadership
- Leadership and planning in agro-industry
- Leadership in communicating of the company's objectives

Theme 3: The process approach and continual improvement – effective tools for food quality and safety management

- Management by process
- The process approach to food quality and safety management
- Continual improvement
- The pathway to improvement

Theme 4: Quality and safety management, starting with suppliers

- Cooperation between actors: the key to quality and safety throughout the supply chain
- Key factors in developing sustainable cooperative relationships
- Strengthening the client/supplier relationship

Activities

Case study Theme 1: A step towards formal quality

- Exercise on Theme 1

Case study Theme 2: Leadership, the key to successful implementation of an HACCP system in an agro-industrial company

- Exercise on Theme 2

Case study Theme 3: The process approach and continual improvement

- Exercise on Theme 3

Activities

Case study 1 Theme 4: Experience of contracting in a juice-producing company

Case study 2 Theme 4: The producers' cooperative Labradores Maya in Guatemala. From Tecpan to Wal-Mart Central America

- Exercise on Theme 4

Assessment

On completion of each theme an exercise is carried out to assess the general understanding of the theme

INTRODUCTION

Quality management refers to the use of planned and systematic actions to ensure that a product or service satisfies quality requirements. In the context of safety management, these actions allow products to be offered in a form that causes no harm to the consumer when prepared and/or consumed in the normal way.

The prerequisite programmes and the hazard analysis and critical control points (HACCP) system involve specific actions for controlling risks to product safety and quality. For example, they incorporate to varying degrees the management of record keeping and the implementation of corrective measures. Standards ISO 9001 and ISO 22000 provide a systematic and integrated presentation of the essential elements needed to demonstrate an organization's commitment to quality and safety.

The requirements of standard ISO 9001:2000 are based on eight quality management principles, which are also considered in standard ISO 22000. Although the specific requirements of quality and safety regulations vary according to the scope of the standard and its objectives, quality principles are of great value when implementing actions to assure quality and safety in the enterprise. This module illustrates basic quality management principles, with special emphasis on four of these principles: (i) leadership, (ii) the process approach, (iii) continual improvement, and (iv) the importance of the client/supplier relationship.

CONTENT

The material is divided into the following four themes.

Theme 1: Principles of quality management in small and medium agro-industrial enterprises

This theme gives a general description of the principles of quality management systems in agro-industrial enterprises as a basis for improving quality and safety management.

Theme 2: Leadership, the key to improving food quality and safety

This theme refers to the importance of (and the elements that define) entrepreneurial leadership as key to improving quality and safety management in an agroindustrial enterprise.

Theme 3: The process approach and continual improvement – effective tools for food quality and safety management

This theme deals briefly with the process approach and its link with the enterprise's improvement strategies.

Theme 4: Quality and safety management, starting with suppliers

This theme focuses on the importance of strengthening relationships with suppliers as a prerequisite for the success of quality and safety programmes and initiatives in agro-industrial enterprises.

ESTIMATED TIME

An estimated 14 hours will be needed to complete this module, including the time required for the training sessions, practical exercises, review of materials and other activities proposed by the participants.

Theme 1: Principles of quality management in small and medium agro-industrial enterprises

INTRODUCTION

Enterprises concerned about the sustainability of their business must recognize the need for continual change in their management strategies in order to adapt to fiercer competition and the globalization of markets for agro-industrial products. Hundreds of businesses and products are launched every day but they do not all achieve a competitive position in the market. Much of the success of enterprises that do succeed stems from the way in which their businesses are managed. Businesses must recognize the importance of a market-led strategy. This entails the use of planning, human resources and knowledge, as well as continual improvement. A series of management models have emerged that incorporate these essential aspects for achieving an enterprise's goals.

The model proposed in standard ISO 9001:2000 is based on eight principles for implementing changes in an organization. The current theme briefly describes these principles as a basis for improving quality and safety management in agro-industrial enterprises.

EXPECTED RESULTS

By the end of this theme, participants are expected to have a better understanding of:

- the importance of the principles governing the implementation or improvement of quality and safety management in agro-industrial enterprises;
- the main strategies that guide entrepreneurial development (impact on the market, the process approach and the need for continual improvement).

SUPPORT MATERIALS

Case study: A step towards formal quality

Reading for Theme 1: General review of the principles of quality and safety management for small and medium agro-industrial enterprises

PowerPoint presentation: Theme 1

Exercise on Theme 1

Case study

A step towards formal quality

A Colombian company with more than 20 years' experience of marketing exotic fruit in foreign markets decided to take advantage of a government-led incentive programme aimed at encouraging enterprises to implement a quality management system based on standard ISO 9001. The company needed to answer questions such as: Where to begin? and Which activities to develop? A working group was set up to design the process for implementing the standard, which was defined in 10 steps. One of the working group members described the experience.

Step 1: Analysis

Objective: to answer the questions 'What do we have?' and 'What do we need to begin implementing the standard?'

After reviewing and studying the standard, and seeing how it applied to the company, we concluded that we needed to do everything, virtually starting from zero. The analysis covered five main topics:

- **Human resources.** It was necessary to find out more about human resources because this standard is based on complex theory and is not easy to understand. We wanted to examine a series of requirements that would help us to guarantee the quality of the process and the product that we offer to our customers. When we investigated our staff's level of education, we found that it ranged from five years of primary schooling to the first year of high school, which was a very low general level. In addition, we did not have a well-defined organization chart.
- **Needs for training and assessment systems.** These needs were analysed and it was found that staff training was essentially an informal process: the workers arrived, they received a 15-minute brief on what their tasks were, and then they were sent to the plant. There were few assessment mechanisms and control systems. A search was made for manuals, but no written procedures or instructions were found. Records were found in note pads and informal notebooks, but there was no monitoring system. In terms of documentation within the plant, attractive posters concerning some national technical standards were posted on the wall but no one had read them, so the level of knowledge was very low.
- **Maintenance and calibration of equipment.** One of the most important pieces of equipment for any fruit-exporting company is a weighing scale. The frequency of maintenance and calibration of the scales was verified. It was

found that some of them had never been touched; they were simply cleaned and reset to zero.

- **Layout of the facility.** There were some well-defined areas in the plant where the operators placed things – although they were not marked as such. The operators knew which type of fruit to place in each area, but the spatial organization was unclear.
- **Strategic planning.** Lastly, we tried to identify the strategic planning guidelines, especially the vision, mission, objectives and policies relating to quality. No formal information of this type was found. The next stage of the analysis was to define a strategy to help the staff to: (i) understand the standards; (ii) comprehend the concept of quality; (iii) become aware of the process.

Step 2: Awareness

Posters were designed and placed in strategic places throughout the plant. The posters described in simple language the concept of quality and the standards required. Two large wall-to-wall banners were placed in the plant proclaiming: “In this company we work as a team to achieve certification.” Teamwork was emphasized because, from that moment on, it really was a team effort. The example of a soccer team was used for teamwork training; a goalkeeper who is not concentrating on the game can obviously affect the final score, or an active forward can score more goals! We had to teach the staff using very simple, concrete examples.

Another strategy used was to stage a staff competition with everyone united around the same objective. The aim was to find a phrase that would identify the certification process. Over a period of two weeks, the workers wrote their ideas in notes and posted them in a box, after which period the ideas were displayed on a poster. This was a totally collective effort that demonstrated the spirit of collaboration. Finally, the winning phrase was chosen: “Quality begins with me.” This was adopted as the slogan for the company’s certification process.

Another important aspect was the way people integrated throughout the exercise, bringing administration and plant employees together in working groups. Training was given first to administration and technical professionals with a better understanding of the more complex concepts. Lastly, each of the department managers was made responsible for training a group of 10 people.

Step 3: Training

The training consisted of providing a clear explanation of the standards required. Practical examples were used for this, such as: When you go to buy bananas in the supermarket, which do you choose? Do blackened bananas look just as attractive as yellow bananas in a bag? Of course, they replied that the yellow bananas were more attractive because of their better quality. The certification process was explained, which involved obtaining documents, audits, applicability of the standard, etc. One aspect that was difficult for the operators to understand was the organization chart.

The strategy used to resolve this problem was to hold a competition to identify each direct supervisor.

Steps 4 and 5: Information gathering and implementation

The most important stages for the successful implementation of standards are gathering information and writing and designing manuals, procedures, records, technical sheets and plant layout plans. We began with the basic procedures in the plant. The operators were asked: “What do you do, and how do you do it?” The first step was simply to describe what each person was doing. After this, training materials were prepared. For example, employees were asked to describe the function of each piece of equipment, and this information was written down. Record-keeping developed as the procedures advanced. As notes were taken, there was a growing perception that these activities could be controlled. Process control records and technical sheets started to be designed. The strategy was to ask people questions, such as: “When you sort mangoes, how do you do it? Which are the problems that cause you to reject the fruit?” Posters were made for each of the problems found, with photographs so that the staff could see the problem that would lead the fruit being rejected for export markets. Finally, layout plans of the plant were prepared so that the plant’s different zones could be identified and delineated. The layout plan was shown to the staff so that they could use it to prevent confusion and misplacing fruit in the stores.

As we did not know how to control our documentation, two office employees were selected for a training course on documentation. They were instructed in all aspects of standard procedures and then given responsibility for ensuring that all the documents were used in compliance with the standard. A consultant was contracted for internal audits. For metrology, office personnel were selected for their training and aptitude for this type of work; in other words, they had to have good mathematical skills. We used certified guidelines and began to develop daily and periodic calibration procedures. Today we have certified scales, which can be used to resolve disputes in the event of complaints from customers.

The topic of traceability caused some problems. When large volumes are handled, lots may become mixed during processing, which makes it difficult to track production to the final customer through the identification of suppliers, packers, sorters, etc. The company decided to send staff members to visit its suppliers and instruct them in quality techniques so that they could guarantee good quality fruit along the entire processing chain.

The plant’s different zones were marked out by painting lines on the floor. Signs were posted and formal training programmes were prepared with clear objectives and goals and qualified instructors. Process monitoring was implemented. At the same time, an assessment system was introduced to ensure that all employees were well trained and tested at all times. These assessments and the progress of the operators

were also monitored. Once all documents, procedures, guidelines, manuals and formats were ready, the next step was to disseminate them.

Step 6: Dissemination

This step covers distributing the documents and collecting the signatures of the people who have received them. The personnel involved in the procedures are called to a meeting where they are shown the documentation and informed that it is now an official procedure. It is important for them to sign the documents because, if workers make mistakes that are outside the agreed procedure, the company has the right to claim that they have failed to carry out their duties. This makes it possible to choose personnel with no quality experience because the documents provide them with systematic instructions on the company's quality policies.

Step 7: Implementation

During the implementation stage, checks are made on whether the workers are following procedures, and corrections are made if necessary. All the relevant areas must be checked to ensure that the system is functioning well.

Step 8: Internal quality audits

This crucial test for the internal auditors and the workers is of concern to all the staff involved. The results of internal quality audits are classified as a 'major non-conformity', a 'minor non-conformity' and 'observations'. In the case of a major non-conformity, the procedures must be redesigned because they are not complying with the requirements of the standard. A minor non-conformity is a simple error that has been detected. For example, a record is deleted or it was used wrongly. Observations refer to suggestions made by the auditors to improve the system, such as a specific change that should be implemented.

Step 9: Pre-audit

There is perhaps a greater level of concern for a pre-audit than for an internal audit. An auditor makes a pre-audit and reviews all quality systems. Suggestions are made regarding the improvement of certain components. This is the main reason for audits: to identify errors that can be corrected and to prevent their recurrence.

Step 10: Certification

The final stage is the certification audit. After the pre-audit, problems are identified and corrected, and documents are amended and prepared for the certification audit. If any major non-conformities are found during this external audit, all the work up to this point could be lost. Everyone should be prepared and aware of this before starting the external audit.

The following table shows a comparison of company procedures before and after applying optimal standards.

Before	After
<ul style="list-style-type: none"> • Information in notebooks • No areas marked out in the plant 	<ul style="list-style-type: none"> • Information in controlled records • Areas marked out in the plant for the control of materials in process and for waste materials
<ul style="list-style-type: none"> • Informal and verbal orders; no procedures • Scales and balances without any calibration controls or maintenance • No defined training programmes and assessment of personnel • No follow-up of customer complaints 	<ul style="list-style-type: none"> • Procedures controlled and well known • Calibration of scales and balances with periodic maintenance • Personnel trained and assessed on activities critical to quality • Customer complaints are filed and followed up with preventive and corrective actions
<ul style="list-style-type: none"> • Everything done by memory; no documentation 	<ul style="list-style-type: none"> • All procedures are documented; any employee can now be replaced by another at any time

Certification is neither a panacea nor a miracle. The fact that a company is certified does not ensure that it will be successful in the market. However, certification is a tool for competitiveness that opens many doors to international trade for the company. Not only does it facilitate working directly with the human resources involved, it also promotes greater integration and commitment within the company. With all these advantages, everyone in any company can follow the motto 'Quality begins with me'. In the case of the Colombian company described above, the adoption of certification has led to a reduction in customer complaints, greater recognition and higher profits in international markets.

Adapted from *Memorias III Simposio Internacional de Frutas y Hortalizas. Servicio Nacional de Aprendizaje SENA, Colombia, October 2000.*

CRITERIA FOR ANALYSING THE CASE

Analyse the fundamental aspects that support the strategy implemented by the company to satisfy the requirements of the relevant standards and to achieve certification, using the following elements:

- Identify the company's key success factors in achieving certification.
- Identify key aspects of the strategy used to ensure the participation and commitment of the plant personnel.
- List the lessons learned from this case that your company could apply or consider.

The same tasks are listed at the end of the theme so that they can be completed on the basis of the newly acquired knowledge.

Reading for Theme 1**M
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General review of the principles of quality¹ and safety management in small and medium agro-industrial enterprises

INTRODUCTION

The quality management principles are the basis of ISO standards. These standards are aimed at improving the functioning of an enterprise through better internal relationships. This increases consumer or customer satisfaction, thereby building the enterprise's capacity to compete and survive over the long term. When an agro-industrial company decides to implement changes to improve its quality and safety management it must understand that success depends largely on the application of the principles described below.

GENERAL QUALITY MANAGEMENT PRINCIPLES

Principle 1: Entrepreneurial vision aimed at satisfying customer/consumer needs and expectations (importance in the market)

The success of an agro-industrial enterprise depends above all on the acceptance and consumption of its products by consumers and customers. Products can only be sold to people that are prepared to buy them. Therefore the company must understand consumers' needs and be able to anticipate any changes in them. Module 1 provided a clear presentation of the importance of market information – including information about the consumer – as a competitive strategy for agro-industrial companies.

In the area of quality and safety management systems, a customer/consumer focus means that the company must concentrate its resources and time on programmes that ensure compliance with the quality and safety requirements and expectations of consumers and customers in the target market. To do this, the company should implement quality and safety programmes that:

- satisfy the minimum requirements demanded by the authorities or customers in its markets; or
- result in a competitive strategy of differentiating the company in the market by satisfying the expectations of consumers and customers and clients in specific market segments.

¹ For the development of the principles of quality management, specifically for the topics related to the benefits and implications of the application of each principle, the following references have been used: The millenium standards (IRAM 2000) and the Principles of quality (D'Aleman – no date).

For the agro-industrial entrepreneur, the benefits of customer focus include:

- exploiting market opportunities;
- making more effective use of the company's resources;
- boosting consumer satisfaction;
- gaining customer and consumer loyalty;
- achieving permanence in the market;
- improving product quality.

Customer focus generally requires:

- research and understanding of consumer needs and expectations reflected in voluntary and mandatory regulations, as well as in market trends;
- assurance that the company's objectives are linked with consumer needs and expectations;
- communication within the company on consumer needs and expectations;
- measuring consumer satisfaction and taking action based on the results;
- systematic management of customer relations.

Principle 2: Lead entrepreneurs who identify changes and implement strategies to carry them out

Leadership means being capable of establishing a clear vision of the company's future. It involves being interactive, establishing values and ethical models of behaviour, setting a personal example, instilling confidence and understanding, and responding to external changes. Agro-industrial companies benefit from interactive strategies that are implemented by far-sighted managers who anticipate change and do not simply react to it. The example of the asparagus industry is given in Module 2. Leaders are responsible for mobilizing and channelling the company's efforts. They develop a strategic plan based on an understanding of consumer needs and expectations. In addition, they communicate the company's objectives to all employees, thereby ensuring the participation of all actors and their commitment to achieving these objectives.

Application of the leadership principle leads to:

- establishing and communicating a clear vision of the company's future;
- improving communication between all levels in the company;
- translating the company's vision into measurable goals and objectives;
- building the capacity of those involved to contribute to achieving the company's objectives;
- developing trained and informed staff;
- encouraging and recognizing staff contributions to achieving the company's objectives.

Principle 3: Involvement of company personnel in the change process to achieve quality and safety objectives

People are the core asset of any enterprise and their cooperation and participation ensures that their talents and capabilities are fully and effectively utilized for the

company's benefit. Programmes for improving quality will not be successful unless they secure the commitment of the people working in the different links in the chain. The company must therefore:

- improve its workers' skills;
- ensure that workers understand the importance of their contribution and their role in the company;
- create autonomy for problem-solving;
- provide incentives for teamwork;
- establish a shared vision in which everyone identifies themselves with the quality policies and objectives;
- act responsibly;
- provide incentives for actively identifying improvement opportunities;
- provide personnel with the necessary resources, training and freedom to act responsibly;
- encourage teamwork by company employees to meet the needs and demands of the group and to improve their degree of personal satisfaction, as work done with interest and enthusiasm leads to better results;
- promote group work, as this builds individuals' capacity to refine their personal skills and working together as a team leads to better results.

Principle 4: Process approach

Any desired result is achieved most efficiently when the related activities and resources are managed as processes (ISO 9000). A process-based approach allows problems to be identified promptly and resolved rapidly, without the need to improve any processes that are already functioning well. This has positive repercussions on the company's capacity to adapt to demanding and changing markets.

Many quality and safety programmes are based on the process approach. For example, in the HACCP system, quality and safety risks are analysed at each step in a specified process. This creates a need to establish critical points in the process where monitoring and testing of these critical points should be implemented, facilitating the subsequent implementation of corrective measures. The process approach is one of the main tools that the agro-industrial company should use to implement any type of quality and safety management system. It is essential to prepare a chart describing all the company's processes, linking each process to the one that immediately precedes it and the one that immediately follows it in the chain, in order to create awareness of the chain and the responsibility of each of its stages in achieving the desired objectives.

The process approach provides a better understanding of all the company's activities because it defines each of the processes involved. It also details individual responsibilities and facilitates the investigation and review of problems and errors. This leads to the necessary corrective measures.

Benefits

The process approach has the following benefits:

- a clear definition of the company's activities and the relationships between them;
- the responsibilities of process 'owners' in managing key activities are clearly defined;
- predictable results can be obtained;
- the interfaces between company activities and links with suppliers and customers can be observed more clearly;
- results can be measured and assessed for each process independently, and decisions can be taken to improve them;
- human and financial resource requirements, as well as the methods and materials needed to carry out activities, can be determined, and this leads to better resource utilization;
- goals and objectives are defined based on an understanding of the capacity of processes;
- the ability to evaluate and forecast process results and their impact on customers, suppliers, etc.

Principle 5: Apply a system and integrated approach to enterprise management

The system approach relies on identifying and understanding the relationships between the different processes carried out by the company, all of which are fundamental to achieving its objectives effectively and efficiently. The company should take into account the relationships and interdependence between its different processes. For example, there is no justification for investing in improving the quality of an agricultural product if there are no means available for conserving this quality during product handling and processing. Also, if entrepreneurs decide to improve handling practices in their plant to ensure product quality and safety, they will not achieve good results if the raw materials are of poor quality. The entrepreneurial approach means applying management and commercial knowledge during the planning, organization, implementation, management, monitoring, adjustment and assessment phases in order to optimize resource utilization while at the same time generating profits.

The implementation of quality and safety systems at any stage of the product supply chain – from farm to fork – requires an understanding of:

- i. the technical changes and adjustments needed;
- ii. the way in which these changes affect the company's cost structure;
- iii. the way in which resources can be obtained to carry out these changes.

This entails identifying the technical and administrative capacity required, as well as understanding clearly the importance of the participation and contribution of each part of the company. This may mean securing the commitment of staff in all departments to meeting quality and safety objectives. Application of this principle leads to a better understanding of the:

- interdependence of company processes;
- importance of focusing efforts on the most critical processes to achieve the quality and safety objectives;
- responsibilities of each department to achieve common objectives;
- importance of taking into account the company's resources – technical, financial and administrative – before acting;
- causes of problems and the actions to be taken to correct them.

Principle 6: Continual improvement

Agro-industrial enterprises cannot escape technological developments in competitive markets. This year's successful product may not be successful next year because:

- another company may produce the same product at a lower price;
- another company may produce the same product with better quality;
- the product may be imported at a lower price and/or with better quality;
- a new product may appear on the market that has greater consumer acceptance.

A policy of continual improvement is needed in order to stay ahead. According to McGillivray (1998), this policy includes one or more of the following activities.

a. Improvement of the crop and/or entrepreneurial activities with the following goals:

- increasing productivity;
- reducing production costs (or perhaps increasing them if this improves productivity);
- improving and ensuring the quality and safety of products.

b. Improvement of marketing with the following goals:

- improving post-harvest handling;
- implementing a more rigorous sorting process;
- improving the presentation of the product;
- searching for more remunerative buyers/markets;
- searching for new markets (e.g. other geographic areas, or seasons, or a new segment of potential buyers);
- forming associations to offer greater and more consistent volumes and to share the costs of better post-harvest handling and marketing;
- offering new products or new product characteristics that attract buyers;
- thinking about the buyer in terms of:

- satisfaction
- quality
- continuity or commitment to delivery of the agreed quantities
- change (always improving products)
- competitiveness (in terms of cost [price], quality and satisfaction)

c. Improvement of the company by analysing the feasibility of:

- producing new products;
- testing new presentations;
- increasing the range of products offered;
- overhauling management and administrative systems;
- introducing new systems for motivating staff.

When should improvement measures be taken?

When a company finds itself in a period of high productivity and profitability, this is the best time to analyse the possibility of initiating changes, improving processes and management or examining new possibilities. This is when the company has the resources to invest in such improvements (McGillivray, 1998). When a company decides to change processes in order to improve quality, this generally means that it will invest in training workers, in improvements to equipment and systems and in continually improving its capacity to face new challenges.

Benefits

Benefits from the application of this principle include:

- better performance resulting from an enhanced organizational capacity;
- capacity to offer better value to the customer at lower cost;
- alignment of the improved activities, at all levels, with the organization's strategic goals;
- flexibility to react rapidly to opportunities.

Principle 7: Factual approach to decision-making: decisions based on data and information analysis

Information is the essential tool – or raw material – for decision-making in the company. A lack of reliable information leads to uninformed decisions, which are often detrimental to the company; for example taking advantage of market opportunities without reliable information, or investing in areas where the critical variables are unknown, may produce unsatisfactory results.

Module 1 of this manual presents an extensive review of the advantages of market information for improving competitiveness and management in agro-industrial enterprises. Decisions and actions taken on the basis of logical analysis, experience and intuition lead to:

- data and information that are accurate and reliable;
- data that are accessible;
- analysis of data and information using valid methods.

Benefits

Benefits of the application of this principle include:

- use of data and information for establishing goals and objectives;
- better understanding of the process and the performance of the system to guide improvements and avoid future problems;

- enhanced ability to demonstrate the effectiveness of decision-making;
- enhanced ability to change decisions based on a review of data and information.

Principle 8: Mutually beneficial supplier relationships

Companies and their suppliers are interdependent. Effective company/supplier relationships create a value added network. The company needs suppliers that it can trust, that know its quality and safety needs and expectations and that can resolve problems in meeting company requirements. Suppliers are therefore vital to the company. The relationship with suppliers is therefore the starting point for quality and safety management. The company/supplier relationship is analysed in Theme 4 of this module. The principle of mutual benefit in company/supplier relationships leads to:

- relationships that produce short- and long-term benefits;
- identifying and selecting trustworthy suppliers with consistent quality products;
- clear and open communications with the supplier;
- sharing information on future projects;
- joint implementation of development projects and improvement activities.

Exercise

COMPLETING THE CASE STUDY

After reviewing the content of this theme and comparing it with your own experience, review your responses to the tasks listed initially and try to identify the principles described in this theme.

APPLYING THE EXERCISE

Carry out the following exercise to improve your understanding of the application of these quality management principles. The company management has decided to implement a programme of best practices to meet its buyers' requirements. Analyse how quality management principles would apply to a good agricultural practices (GAP) programme (if your business is in primary production) or to a good manufacturing practices (GMP) programme (if your business is in packing and/or processing). Use the information provided in Table 1 to complete your answers.

TABLE 1
Summary of the principles of quality and safety management in small and medium agro-industries

Principles	Questions to guide the analysis	Actions/activities that can be carried out
1. Customer focus	Which needs or expectations will be satisfied by the programme?	Interviews with major customers.
2. Leadership	Why is it necessary to apply the leadership principle?	An analysis to identify the person with the qualities to lead the changes in the company for implementing best practices.
3. Involvement of all actors	Which strategies should be implemented to secure the commitment of all employees?	Initial meeting and training of middle-level staff on the system to be implemented. Design a timetable of activities to communicate changes as they are implemented. In drawing up system documents, seek the support of employees involved in each process and activity. Initiate a poster campaign so that all personnel are aware of work requirements and procedures.
4. Process approach	What are the implications of adopting a process approach?	Prepare a map of the company's processes, indicating the strategic processes, the support processes and those dealing with operations.
5. System approach to management	How can the relationship between GAP or GMP programmes and management be established throughout the enterprise?	After producing the map, determine and document how the processes are interrelated and who is responsible for each process.
6. Continual improvement	How can GAP or GMP programmes become a tool for promoting continual improvement in the company?	Carry out an internal audit, at least annually, to identify points for improvement. Prepare at least two action plans for the improvement of two of the audit's findings that are of importance to the company.
7. Factual approach to decision-making	Give examples of how to apply this principle during the implementation of a GAP or GMP programme.	Prepare a summary of products sold and batches rejected for failing to meet customer specifications. Keep up-to-date data on the maximum residue limits for products in the target market. Track the trend in product prices by market, by type of customer and by level of demand in the GAP protocols.
8. Mutually beneficial supplier relationships	How would a GAP or GMP programme mutually benefit suppliers and the company?	Adapt inputs to the company's needs. Prepare quality specifications for packaging in agreement with the supplier. Assess each supplier according to the quality of packaging, price, delivery service and flexibility for delivery outside the programme.

Assessment of the theme

Additional pages can be used to answer these questions.

- 1. List the eight quality management principles.

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- 2. What are the benefits of involving staff in the processes of change in the company?

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Think about your own company

- 1. How would you apply these principles in the context of your own company? According to your business interests, describe in detail which actions you would take, based on each of the eight quality management principles. For this exercise use the example above.

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- 2. Identify areas where you could improve application of the principles.

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Summary

- The quality management principles can help enterprises to enhance operations by improving internal relationships that lead to consumer or customer satisfaction.
- When an agro-industrial enterprise decides to implement improvements to quality and safety management, it must take into account the fact that the success of these initiatives is largely dependent on the application of the eight quality management principles.
- Customer focus: the success of an agro-industrial enterprise depends, above all, on the acceptance of its products by consumers and customers. Products can only be sold when someone is prepared to buy them. Therefore the enterprise must know and anticipate the needs of its consumers.
- Leadership: great industrial enterprises benefit from interactive strategies implemented by leaders that can foresee change and not simply react to it.
- Commitment of the company's employees to the process of change: people are the core asset of any enterprise, and their participation and cooperation allows their skills and capacities to be used more fully and effectively for the company's benefit. Programmes for improving quality will not be successful without the commitment of the people involved in the different steps and links in the chain.
- The process approach is used to identify and resolve problems quickly without modifying other processes that are already functioning well. This has positive repercussions for the organization's response capacity, especially in adapting to a changing and demanding market.
- The system approach to management relates to identification and understanding of the relationships between the different company processes. This is essential to achieving the company's objectives efficiently.
- Continual improvement: an agro-industrial enterprise cannot escape technological developments in competitive markets. A product that is successful this year may not be around the following year. In order to keep ahead, entrepreneurs must pursue a policy of continual improvement. Determining which are the most critical processes, and seeking measures to improve them, is a way to consolidate processes, reduce the costs of failure or mistakes and increase efficiency.
- Factual approach to decision-making: information is a fundamental input for decision-making within a company. Lack of information or use of unreliable information leads to uninformed decisions that are often detrimental to the company.

- Mutually beneficial supplier relationships: relationships between the company and its suppliers should be advantageous to both parties in order to establish trustworthy and lasting relationships.

Theme 2: Leadership, the key to improving food quality and safety

INTRODUCTION

Agro-industrial entrepreneurs recognize the increasing importance of quality and safety assurance systems and tools for coping with market challenges and anticipating new trends. However, it is one thing to recognize the importance of such strategies but quite another to make the necessary changes to implement them. The following questions should be asked: Does the company have leaders with the necessary knowledge, motivation and training to initiate the changes required to improve its quality and safety management? Who will generate or create the team environment and the synergy required to deliver these changes?

Leadership is essential for changing current thinking and behaviour and defining strategies within the company, which is crucial to achieving the goals of quality and safety. This theme illustrates the fundamental importance of entrepreneurial leadership for improving safety and quality in agro-industries.

EXPECTED RESULTS

By the end of this theme participants are expected to have a better understanding of:

- the importance of leadership as a key element of change and of quality and safety initiatives;
- the function of leadership in planning and improving quality and safety management in the company.

SUPPORT MATERIALS

Case study: Leadership, the key to successful implementation of an HACCP system in an agro-industrial company

Reading for the theme: The importance of entrepreneurial leadership to the success of quality and safety management programmes

PowerPoint presentation: Theme 2

Exercise on Theme 2

Case study**Leadership, the key to successful implementation of an HACCP system in an agro-industrial company****Background**

A small company processing vegetable pastes (artichokes, mushrooms and olives) has 30 employees. In recent years it has grown significantly after diversifying into new products, which has enabled it to enter more demanding markets. The manager recognized that, to be competitive in this market, the company needed to guarantee the safety of its products. It was therefore decided to implement an HACCP system.

Development

The company implemented the HACCP system with the support of external consultants. The manager made the following comments on this experience. The results of the initial analysis were not very good. We only fulfilled 20 percent of the requirements for good manufacturing practices. The most important observations were: (i) inadequate standards of personal hygiene, cleaning and disinfection; (ii) one part of the infrastructure did not comply with the minimum hygiene requirements; (iii) there was no process control programme. It was decided that the consultants would resolve the problems identified, except for those concerning infrastructure.

Outcome

The consultants explained that the first step towards real change was for someone in the company to assume the role of leader. This person had to communicate freely and directly with the employees, motivate them to achieve the objectives and ensure that the necessary resources were available. Initially these recommendations were not followed. For example, employees had to be sanctioned and given warnings because they failed to comply with GMP and HACCP procedures. This created a volatile atmosphere that led to the resignation of some workers. Those that stayed did not apply the recommendations, or applied them only partially. This led to reflection and changes in attitude. The manager began to participate actively in staff training. He talked with all staff members to explain the company's objectives and plans. In particular, he began to apply the company procedures just like any other worker.

At the same time, the most dynamic employees were identified and work teams were formed. Mechanisms were also put in place to motivate employees, such as contests, birthday parties and prizes for the best workers. This achieved surprising

results: 100 percent application of the procedures by the employees, improved tidiness and cleanliness in company work areas (production, storage and services) and a better working atmosphere.

Source: Munoz, J. 2006. Article entitled '*El liderazgo, Clave del Éxito de la Implementación del Sistema HACCP en la empresa ZEMUSA. Caso Empresa ZEMUSA, Peru*'.

CRITERIA FOR ANALYSING THE CASE

From a business perspective, analyse the key aspects of the strategy implemented by the company to set up the HACCP system. Answer the following questions:

- Which management tools do you believe the company manager used to implement successfully the HACCP system?
- How do these strategies differ from those implemented by the export company in the case described in Theme 1 of this module?
- Which of the lessons learned from this case study could your own company apply or consider?

The same questions are posed at the end of this theme so that they can be answered based on the newly acquired knowledge.

Reading for development of Theme 2

The importance of entrepreneurial leadership to the success of quality and safety management programmes

INTRODUCTION

What is an entrepreneurial leader?

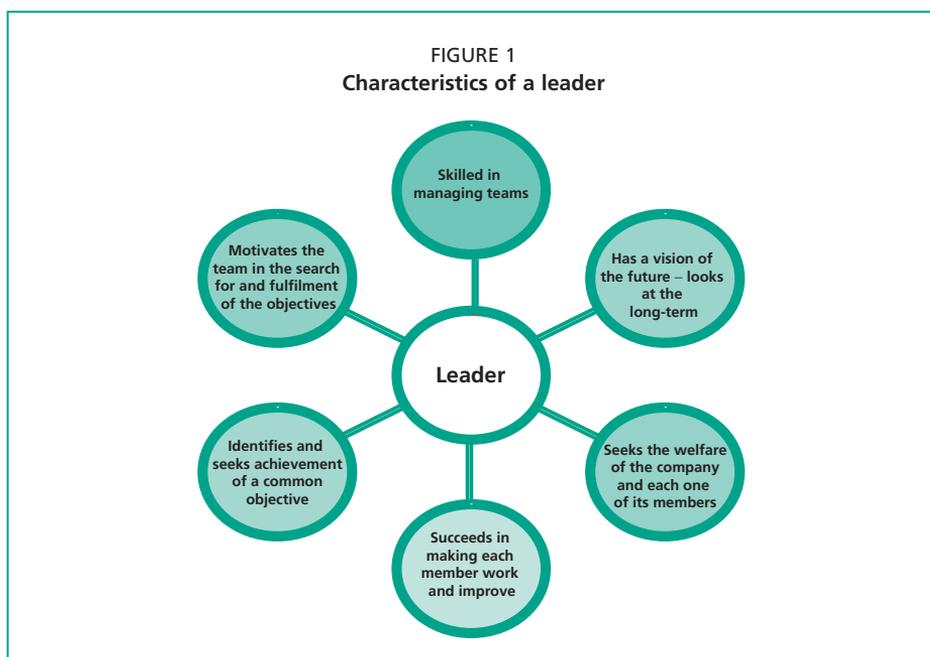
Generally speaking, an entrepreneur is a person that turns ideas and dreams into reality and builds and manages projects. According to Diaz and Pedraza (2001), these are some of the characteristics that define an entrepreneur:

- demands efficiency and excellence;
- is motivated and transmits this to the staff;
- is persistent in defining objectives and working towards them;
- takes risks based on reliable information;
- works in a team taking into account staff capabilities;
- looks for solutions, planning and defining strategies;
- seeks advice;
- seeks profitability through continual improvement;
- proposes changes and leads their implementation;
- looks for opportunities.

A leader is a person who is able to guide through words and actions, without resorting to sanctions. Leaders are able to combine individual interests and capabilities in a way that contributes to achieving the company's objectives. Figure 1 illustrates the characteristics that define a leader. A fundamental characteristic of agro-industrial entrepreneurs is their capacity to visualize changes and initiate processes of change. The owners or managers of small and medium enterprises are expected to be leaders. They are also responsible for identifying company employees with leadership qualities who will help them to prepare and implement plans and strategies for meeting the defined objectives.

Entrepreneurial leadership

This can be defined as a set of tools for describing the company's vision and mission; disseminating information on the policies and objectives that will guide company activities; planning; taking decisions in consultation with the staff; making continual improvements in all processes; stimulating creativity and initiative and fostering ongoing learning by company staff (Government of Chile, 1999). If we compare company management with driving a car, the objective is to reach the destination, the route is the plan, the car is the company and the driver is the leader.



Enterprise leadership mobilizes and channels the company's efforts by establishing strategic plans based on an understanding of consumer needs and expectations, taking into account the company's resources. It also facilitates communication of the company's objectives to the entire staff, thereby securing the participation and commitment of all actors in achieving these objectives.

Leadership and planning in agro-industry

Planning is a set of decisions concerning the activities that must be undertaken in order to achieve goals and defined objectives (McGillivray, 1998). It is a management tool that allows the company to decide in advance: (i) what should be done; (ii) who should do it and (iii) how it should be done in order to fulfil specific objectives.

For the planning process, entrepreneurs and their teams must understand the internal and external environment of the company and possess the skills to mobilize the technical, administrative and financial resources needed to support the process.

Planning and the hierarchy of objectives

The first step in the planning process is to define the company's goals and objectives. These are defined at different levels. At the very top are the company's mission and vision.

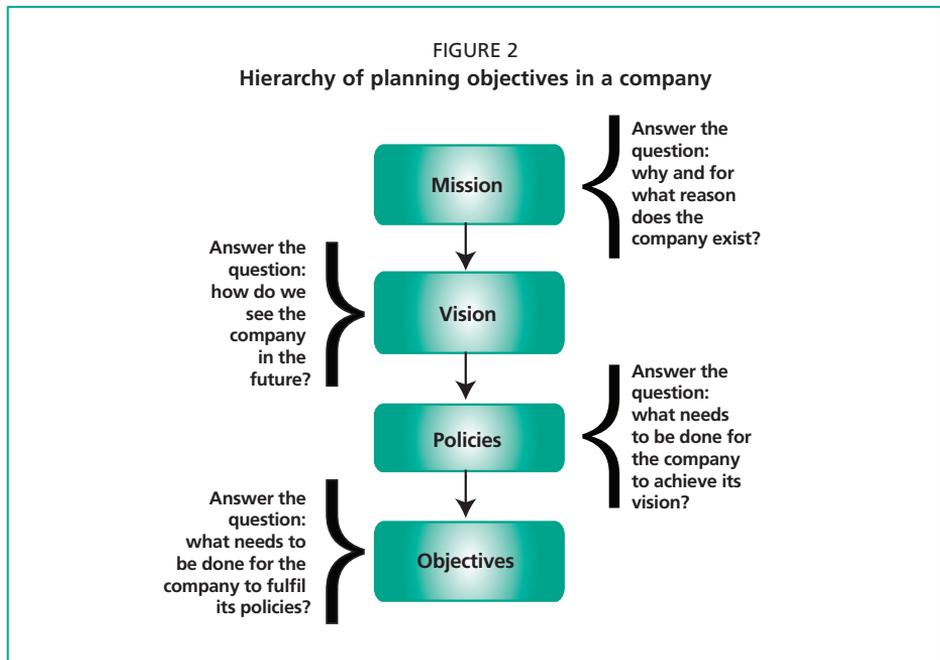
The *mission* refers to the company's general goal in terms of its purpose, values and range of action. *Vision* refers to the company's ideas, which answer the question: How do we see the company in the future? *Policies* are the company's

Example of leadership

DELIS is a cheese-producing company in Chorrera, Panama. This small company was processing about 100 litres of milk per day under such difficult conditions that the health authorities were considering closing it down. The company owner's decision to introduce improvements with the support of an international project transformed the company. It is now the top seller in its home city and has maintained constant growth, reaching new markets such as Panama City. In addition to these achievements, this small company has become an attractive place to visit for processors from other parts of the country, as well as from other countries in the region. Students from various universities studying food and nutrition-related disciplines also visit the company to learn about this successful, small-scale experience in enhancing quality and productivity.

Source: *Gestión de la calidad en pequeñas y medianas empresas*. Memoria del proyecto co-patrocinado por OEA y GTZ, 2000.

goals, which answer the question: What must the company do to achieve its vision? *Objectives* answer the question: What must the company do to fulfil its policies? This hierarchy of objectives is presented in Figure 2.



Source: *Políticas de la empresa – ¿para qué sirven?* Vásquez 2004

The company's goals and objectives must be communicated to the staff in such a way that each individual identifies with them and contributes effectively to their achievement. The company's policies and specific objectives must be understood by all employees. All employees should be able to describe in their own words how their jobs contribute to the company's success. This is achieved by a continuing programme of staff awareness training in which the company's policies are explained, together with an outline of how each employee contributes to their achievement and the benefits that this will bring to the company.

Some examples on the definition of mission, vision and policies are provided below.

Example of the hierarchy of a company's objectives

San Jacinto Sugar Company (Peru)

Mission

To supply sugar and sugar products as well as other quality agro-industrial products that are competitive in the national and international market, to preserve the ecosystem and to generate profits for shareholders and welfare for the workers and the community.

Vision

San Jacinto, an ideal place to work and develop as people. A company that is organized, reliable, ethical, innovative, interactive and highly productive, which supplies quality agro-industrial products and services and is committed to the community and the environment.

Policies

The company describes its activities as follows:

- It offers quality products derived from sugar cane and other agro-industrial products and complies with the requirements set by the company to meet its customers' needs and expectations.
- It promotes the development of its workers to enable them to carry out their work effectively and efficiently in a way that encourages their personal development.
- It develops leadership and teamwork in the fulfilment of its objectives.
- It applies continual improvement to its processes and continually improves the effectiveness of its quality management system in order to comply with established requirements.

Source: *Empresa Agroindustrias San Jacinto. Sección-Información Compañía: Misión, Visión y Políticas* (undated)

Management must be fully aware of its role in this process. There is no possibility of success if management does not lead by example and make available the necessary resources (financial investment, materials, infrastructure, etc.). The staff must only pursue policies that reflect the attitudes of management.

The following example shows the importance of defining objectives for pursuing the company's policies.

An example of the relationship between policies and company objectives

Policy on quality

The Department of Food Services and Promotional Articles is committed to providing quality products and services to satisfy client needs and expectations, while achieving efficiency in its processes as well as training staff for continual improvement.

Quality objectives

- Obtain and maintain a total score of 4.0 in the client satisfaction survey.
- Attain 15 percent profitability.
- Attain a total result of 1.5 in the survey on organizational climate.
- Support staff in completing one general training course and one specific training course or skills certification.
- Maintain a quality management system.

Source: *Tecnológico de Monterrey. Dirección de Servicios Alimentarios y Artículos Promocionales (sin fecha)*. <http://www.mty.itesm.mx/dae/dsa/iso.htm>

Importance of defining goals

Defining goals:

- provides a sense of direction;
- focuses efforts;
- guides plans and decisions;
- helps to assess progress.

Points to consider when establishing objectives

The following points should be taken into account when establishing objectives:

- They should be realistic and achievable within a specific time frame.
- All company employees should be aware of how the different areas contribute to the objectives; each area should set its own objectives in such a way that they contribute to the company's general objectives.
- Objectives should be measurable (for example, 'improve' is a desire, not an objective).
- It must be possible to check whether or not an objective is being achieved and, if not, to decide what needs to be done.

Strategic planning versus operational planning

Planning can be carried out at different levels. Strategic plans establish the company's general goals, while operational plans indicate how the strategic plans are implemented in order to achieve the company's policies. (Module 4 describes in more detail the steps to follow in preparing the company's plans.)

Main advantages of planning

The main advantages of planning are that it:

- reduces risk, minimizing the uncertainty surrounding the company;
- identifies the resources needed to achieve the objectives;
- directs the company's employees to carry out activities and take decisions that are in line with the objectives and chosen procedures;
- controls the fulfilment of company objectives;
- sets priorities that focus on the company's strengths.

LEADERSHIP IN COMMUNICATING THE COMPANY'S OBJECTIVES AND SECURING STAFF COMMITMENT

According to Nobel Prize winner, Gary Becker, human capital is the only investment that can generate unlimited yields for exponential growth in enterprises (Fairbanks and Lindsay, 1997). An entrepreneurial leader recognizes the value of human resources in achieving the company's objectives. Therefore, the effective communication of these objectives and the continuing training and motivation of personnel represent a hidden source of growth for companies.

Most quality and safety management programmes include staff training, which is essential for achieving the proposed objectives. Worker motivation also has a direct relationship with the quality and efficiency with which workers carry out their responsibilities.

COMPANY FACTORS THAT PROVIDE MOTIVATION

The company factors that provide motivation are:

The company's objectives, if correctly defined, clearly indicate the responsibilities of employees.

- Assessment of the degree of fulfilment of the objectives, as this provides the necessary feedback to boost the sense of achievement and recognition.
- Participatory management demonstrates that decision-making is shared with staff.
- Allocating clear and concrete responsibilities for employees with regard to the overall process in the workplace, as well as setting up mechanisms for the recognition of good work.
- Internal coordination that favours collaboration rather than control.
- Communication in all directions in order to receive suggestions and proposals for improvement.
- Provision of the means and procedures to perform tasks well (right first time) encourages good work.

- Teamwork encouraged by management (more information on this topic is presented in Appendix 2).
- Confidence of staff in the company's future and being involved in shaping it; this creates a sense of belonging.

An example of motivation: Irurtia Wines (Uruguay)

The bottling plant of Irurtia Wines, a company located in the city of Carmelo, had a problem that was resolved by a motivation system. The machinery that was being used for bottling was imported and was very expensive and costly to maintain. The company had a problem with maintaining and cleaning this machinery. The solution to this problem was to use a financial incentive system. As each machine was operated by one employee, employees were asked to keep their machines as clean and well maintained as possible. A supervisor kept a daily record of the state of each employee's area. At the end of each month, results were compared and the employee with the best performance was awarded a prize.

The company is trying to keep the incentive system going because competition among the employees is fierce and everyone works hard to win the prize; without this, employees could lose motivation. The results have been excellent: the machines are impeccable, the employees make every effort to win the prize, which is added to their salary at the end of the month, and the administration has been freed from the uncertainty associated with having to invest in expensive machinery. The system has one drawback: competition between employees has led to significant rivalries.

Source: Cabrera, T. 2001. *Motivación en las empresas uruguayas*.

Exercise

APPLYING THE EXERCISES

- After reviewing the content of this theme and comparing it with your own experience, review your answers to the questions posed earlier and try to correct or supplement them. Link your answers to the topics presented in this section, taking into account the case study of this theme.
- A company that is preparing to launch a new product into the market (precut and packaged lettuce for a supermarket in its local area) wishes to begin implementing a quality management system, and you are a consultant in this field. First of all, define:
 - the mission and vision;
 - the company's policies.

- In addition to the product, take into account the customers, staff, environment, safety and continual improvement. Then define three objectives that will enable you to formulate a strategy for launching the new product.
- c. In order to improve your understanding of the content of Theme 2, try to apply the concepts developed in the context of your own company by carrying out the following exercise. Form work teams in your company. Try to assemble teams of people doing the same type of work (e.g. group operators by production line) and carry out the following.
- Explain the company's mission, vision, policies and objectives (if they are defined).
 - Explain the reason why the working groups have been formed, emphasizing the importance of staff contributions to the company's results. Apply the concepts of staff motivation.
 - Select a person in each group who will be responsible for coordinating the group's work and presenting the results of its work in a plenary meeting.
 - Encourage each group to characterize the work that they carry out, in order to identify problems that occur frequently while they are working. Based on this, each group should establish priority actions and prepare a plan of action that includes suggestions for solving the problems identified.
 - Distribute copies of Table 2 to make it easier for each group to describe the activity.
 - Agree with all the working groups on how long they will work before all the teams come together to present their results.

TABLE 2

Questions to guide the company planning analysis

Question to guide the analysis	Objective of the question	Answer
What is done?	Defining the task	
For what purpose is it done?	Need that is met by the task	
Why is it done?	Objectives	
With what is it done?	Material resources	
Which people?	Human resources	
Who?	The person responsible for the action or process	
When is it done?	At what time	
Where is it done?	Place	
How much time/how many times?	Frequency	
How is it done?	The way in which the activity or process is carried out	
Summary of problems identified		
Priority problems		
Recommended actions		

Assessment of the theme

Additional pages may be used to answer these questions.

1. Describe the importance of leadership in the management of a company for achieving food quality and safety objectives.

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2. What is entrepreneurial leadership?

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3. What is the relationship between company planning and entrepreneurial leadership?

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4. Define the importance of leadership in achieving employee participation and commitment to the company's quality and safety objectives.

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5. Reflect on how the leadership qualities of some of the company's employees could be used to attain its quality and safety objectives.

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Summary

MODULE 3

- A leader is a person who is able to guide through words and actions, without resorting to sanctions. A leader is able to combine individual interests and capabilities in a way that contributes to achieving the company's objectives.
- Entrepreneurial leadership can be defined as a set of tools for describing the company's vision and mission: disseminating the policies and objectives that will guide company activities; planning; taking decisions in consultation with the staff; making continual improvements to all processes; stimulating creativity and initiative and fostering ongoing learning by company staff.
- A company's policies are a set of basic guidelines that show the path the company must follow to realize its vision, together with the objectives that define what the company needs to do to fulfil its policies.
- Planning is a management tool that allows the company to decide in advance what it must do, who must do it and how it should be done to fulfil specific objectives.
- Everyone in the company should understand their responsibilities and what they are authorized to do (authority), as well as the relationship between responsibility and authority. This is of vital importance for employees whose activities may affect food safety and quality.
- Nowadays, continuing training is a prerequisite for a company's survival because it influences its competitiveness and its employees' commitment.
- The best way to exercise leadership in a company is by motivating the staff. It is generally agreed that a person's behaviour depends on their level of motivation. The most important motivation factors are:
 - achievement
 - recognition
 - responsibility
 - specific work tasks
 - personal development
 - belonging

Theme 3: The process approach and continual improvement – effective tools for food quality and safety management

INTRODUCTION

Two decades ago, most leaders of agro-industrial enterprises focused their efforts on correcting and improving their production processes, ignoring the considerable contribution being made by other areas of the enterprise to achieving their objectives. Nowadays, entrepreneurial leaders think in different terms. They no longer focus their efforts exclusively on production processes, as they understand that many other company processes need to be reviewed periodically, then updated or improved, in order to improve efficiency in the company as a whole. These processes are just as important as production processes for maintaining the company's competitiveness.

Markets have created a growing need to adjust business processes in response to market demands. It is now clear that good management, based on a process approach, is an essential component of successful policies and strategies. Similarly, the need for continual improvement in response to the dynamism of markets can be met by restructuring and adapting key strategic business processes.

This theme explores the importance of applying a process approach and seeking continual improvement to quality and safety management in agro-industrial companies.

EXPECTED RESULTS

By the end of this theme participants are expected to be able to:

- understand that an agro-industrial company functions as a network of processes;
- define a process and its components as they relate to improving management quality within the company;
- assess the importance of organizing the company by processes as a complement to organization by functions;
- understand the relationship between continual improvement and sustainable competitiveness;
- identify the steps to follow for integrating continual improvement in the company.

SUPPORT MATERIALS

Case study: The process approach and continual improvement

Reading for the theme: The importance of the process approach and continual improvement in quality and safety management

PowerPoint presentation: Theme 3

Exercise on Theme 3

Case study**M
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The process approach and continual improvement

Situation 1: Identifying the right solutions

Background

The sales department of a company producing fruit jams and concentrates is responsible for receiving orders and checking the order against the product description and the order specifications. The staff member in charge of this task proposed that the order-checking process should be eliminated. He thought that the salesperson should be responsible for carrying out the order correctly and that there was no need for checking as it represented unnecessary costs for the company. The sales area could then work on other activities during the 15 hours per week usually dedicated to the process of confirming orders.

Development

The company management approved the proposal and decided to adopt it because it meant that the company would reap the following benefits:

- savings in time required to carry out the comparison;
- savings in time and the cost of telephone calls to the salesperson to determine if the number or description was correct;
- savings in time required to review orders as they were entered into the computerized filing system.

Outcome

Evidently this was not the right decision. Although the idea had been to reduce costs, the end results of the measure were disastrous. Two percent of all customers began to receive the wrong products. The night before a trade fair, one client, who had ordered 300 boxes of peach concentrate and 200 boxes of mango concentrate, received only 200 boxes of mango concentrate. The result was an unhappy customer, which damaged the company's reputation.

Source: James Harrington. *Business Process Improvement Workbook* (1993).

Situation 2: Understanding the relationship between business processes

Background

A small company producing fruit concentrates has 20 employees. The company has gradually consolidated its market position and achieved a significant increase in sales in the past few months.

Development

The company began to have problems because it was unable to meet the deadlines set by its customers. The manager conducted a survey to identify which adjustments were needed to make the production process more efficient, enabling the company to increase its productivity. In discussions with the manager, it was agreed that the existing fruit peeling and pulping operations demanded a great deal of time because they were carried out manually. To improve this process, the entrepreneur decided that both the person in charge of weighing raw materials and the operator in charge of quality control would devote several hours of their time to peeling and pulping operations.

Outcome

Although the company managed to increase its production by 1 percent, two weeks after this measure had been implemented, customers complained that the product tasted bitter. The company was forced to recall all its products. Apparently, during the previous two weeks there had been some confusion and, instead of adding citric acid, the employee in charge of inputs to the process had been adding a preservative that looked similar.

Source: Muñoz, J. 2006

Situation 3: Business strategy: seeking opportunities for growth and improvement

Background

About 15 years ago, a Peruvian farmer decided to take advantage of growth in Peru's asparagus exports by cultivating 15 hectares of the crop.

Development of the initiative

At first the farmer's lack of knowledge concerning asparagus production resulted in low productivity and hence low returns on his investment. However, he gradually gained experience and knowledge about the crop and the business. He invested in better quality seed, in modernizing the irrigation system and fertilization regimes suited to the soil conditions and to asparagus requirements. The technical upgrading of his crop production methods greatly increased the yield per hectare (from 6 tonnes to 16 tonnes). At a later date, the producer decided to explore the possibility of forward

integration by exporting directly. A few years ago, the producer benefited from a programme to support the implementation of good agricultural practices and obtained GlobalGAP certification. Today the company produces and exports fresh asparagus in 10 different forms to satisfy customers in the United States market.

The entrepreneur then analysed the possibilities for contracting with suppliers as a strategy for expanding his business. He is also exploring the possibility of participating in an export consortium with two other companies in order to have more negotiating power with buyers. He is also considering the possibility of accessing regional markets in neighbouring countries in order to diversify markets and reduce the risk of dependence on a single market.

Source: adapted by Diaz, L. Personal interviews with producers, Lima, Peru. 2006.

CRITERIA FOR ANALYSING THE CASE

After reading the cases carefully, analyse them as follows:

- Identify differences in the management approach in the three cases described.
- For situations 1 and 2, identify the main factors that led to the wrong decision. Do you think they took into account the relationships between their business processes?
- For situation 3, determine the strategies implemented by the entrepreneur to promote business development.
- From your own experience, identify initiatives that you have undertaken for solving problems or carrying out improvements that have had negative results. Which of these initiatives failed because of a lack of understanding of the relationships between business processes?

The same questions are posed at the end of the theme so that they can be answered using the newly acquired knowledge.

Reading for development of Theme 3

The importance of the process approach and continual improvement in quality and safety management

MANAGEMENT BY PROCESS

In recent years, management by process has become a very important business tool for quality management. It means organizing and managing the company's activities in a coordinated way, with a view to achieving customer satisfaction and to improving effectiveness and efficiency in the use of resources. When describing the benefits of the process approach, standard ISO 9000 states: "A desired result is achieved more efficiently when activities and related resources are managed as a process" (Figure 3).

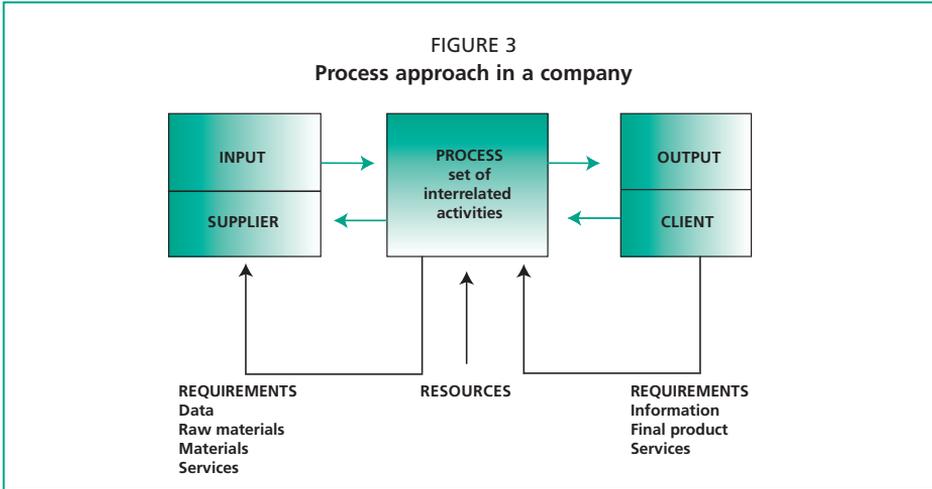
WHAT IS A PROCESS?

According to standard ISO 9000², a process is a set of interrelated or interacting activities, which transforms inputs into outputs. For an agro-industrial company a process is a set of interrelated activities that add value to an input, to obtain a result that satisfies customer requirements.

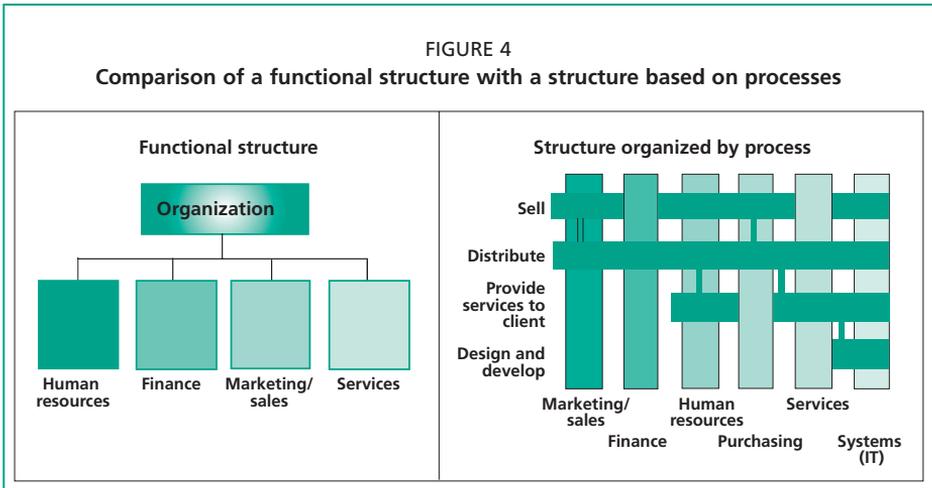
THE PROCESS APPROACH TO QUALITY AND SAFETY MANAGEMENT

To structure the management of a business using a process approach it is necessary to adopt a horizontal vision of the company's operations, which requires an understanding of the relationships between the various company activities (Figure 4). The process approach entails listing all activities within the company, deciding which of these activities are essential to achieving business objectives (e.g. the supply of raw material) and presenting them as processes. These processes have inputs as well as requirements arising from internal and external clients, regulations and resources. In turn, the processes are transformed, through a series of activities, into outputs or results (either final or intermediate products). The outputs or results are then used as inputs to other processes. In this way, each process is connected to another, and a system is created that reflects an understanding of the network of processes within the company and their interactions (Figure 5).

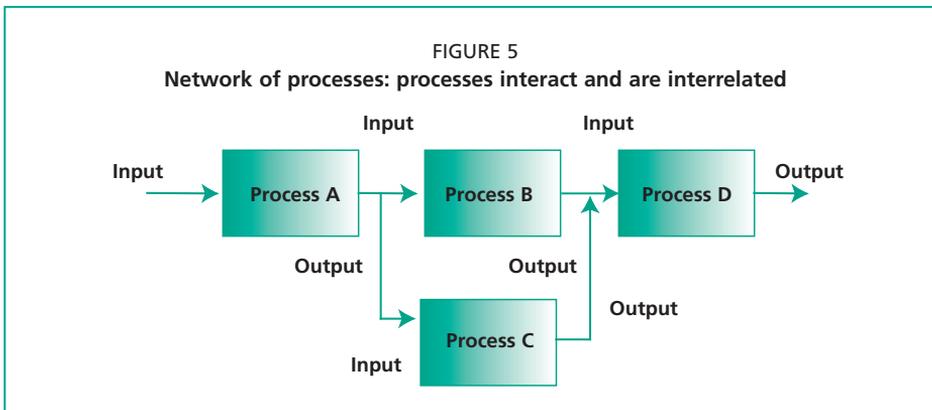
² ISO 9000 (2000). International standard certified translation. *Quality Management Systems – Concepts and Vocabulary*.



Source: Arrascaeta, R. 2005.



Source: Arrascaeta, R. 2005..



Source: ISO/TC 176/SC 2/N 544R2®, 2004

CHARACTERISTICS OF A PROCESS APPROACH

These are the characteristics of a process approach:

- Inputs and outputs may be tangible (materials, equipment or components) or intangible (information, energy).
- Outputs may also be waste or contamination.
- Each process has clients or stakeholders that may be internal or external to the company. They define the outputs, or the results required, to meet their needs and expectations.

Types of process

Although there is no defined classification of processes, they can be divided into three groups:

- operational processes related directly to producing a product or service;
- support processes supporting the operational processes, which are generally related to resources or measurement processes;
- strategic or management processes refer to management responsibilities that deal mainly with planning or strategic issues.

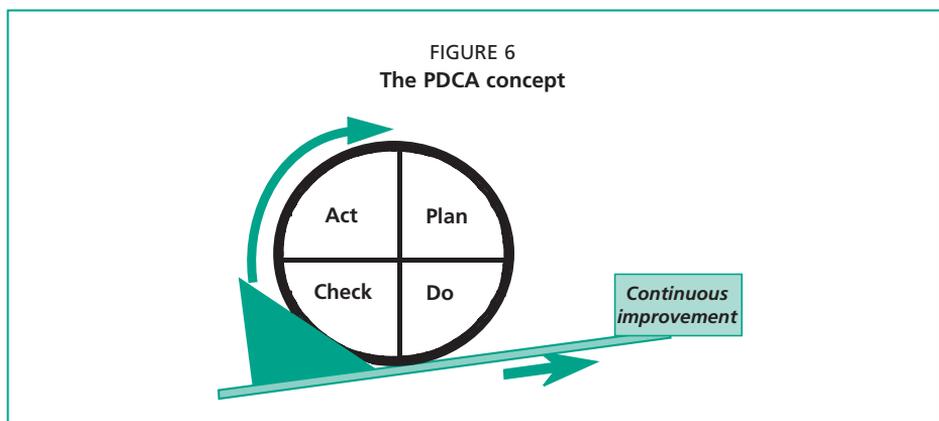
MAIN ADVANTAGES OF A PROCESS APPROACH

A process approach allows:

- systematic identification of the activities that make up a process;
- identification of relationships with other processes;
- definition of responsibilities for each process;
- analysis and measurement of the capacity and efficiency of the process;
- focusing on resources and methods for improving the process.

Steps for applying a process approach

All processes can be managed according to the planning, doing, checking and acting (PDCA) concept (Figure 6). The PDCA concept is present in all areas of our professional and personal lives and is used continually, either formally



or informally, consciously or unconsciously, in all our actions. Each activity, no matter how simple or complex, follows this continuing cycle. In the context of an enterprise management system, PDCA is a dynamic cycle that can evolve within each process of the organization, as well as within the system of processes as a whole (ISO, 2001).

Plan

Define goals and objectives and the activities that will contribute to achieving them.

Do

The identified actions are carried out; education and training are provided.

Check

After applying the improvement action, a check is made to see if objectives have been achieved.

Act – replan

If the objectives have been achieved, standardization of the activities becomes an established part of the company's procedures; otherwise an assessment is carried out to identify errors and take appropriate action.³ Taking the PDCA concept as a basis, the following steps are proposed for implementing a process approach in small and medium agro-industries.

Step 1: Identification of the processes and their sequence

There are three steps to identifying all the processes involved in obtaining the expected results, according to the company's policies and objectives:

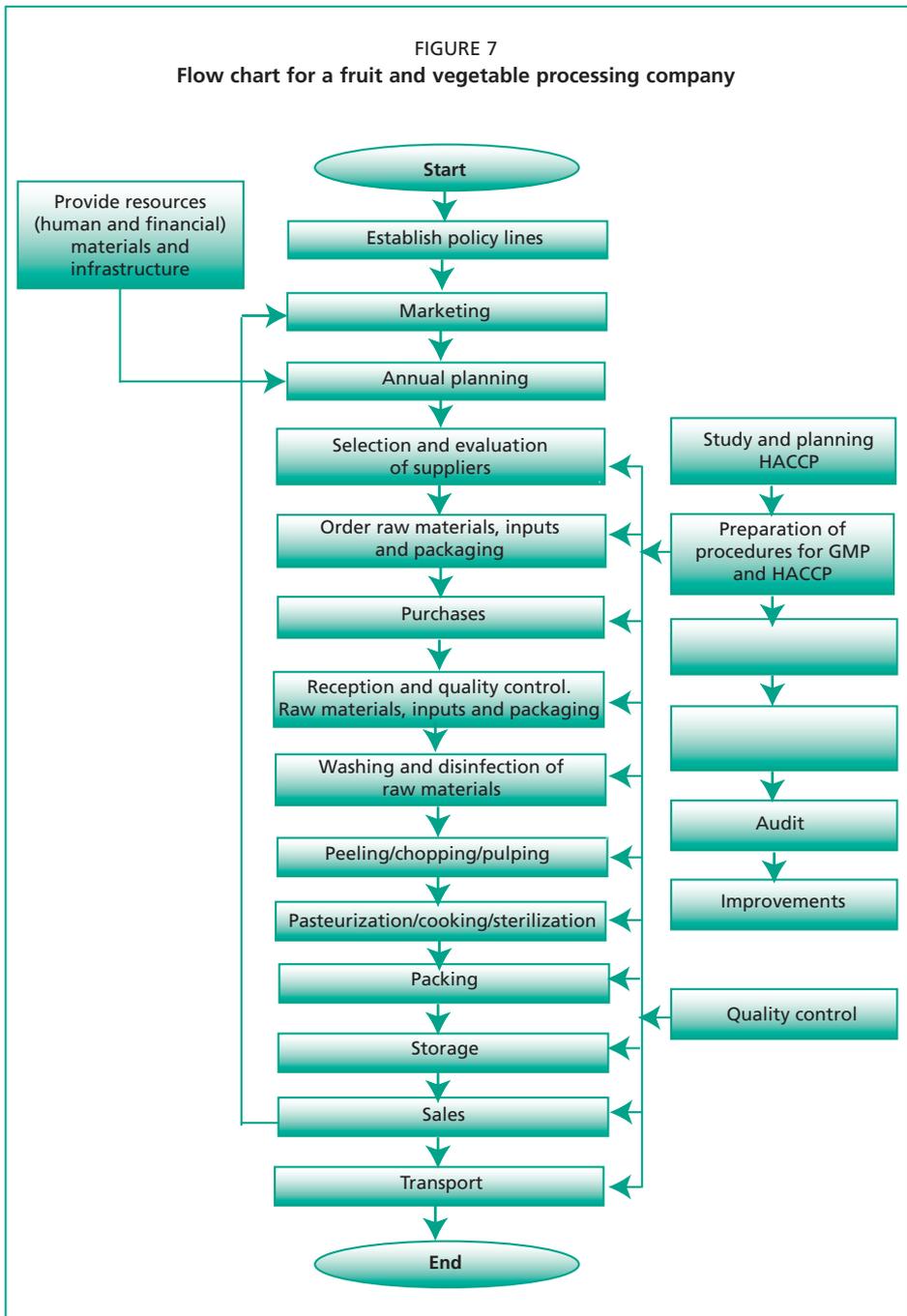
- identification of activities;
- identification and sequencing of processes;
- identification of priority processes.

A. Identification of activities

A flow chart can be used to represent the activities that are carried out in the company and the sequence of activities. The activities must be identified before examining how they function and how they relate to the different steps in the company processes. Figure 7 gives an example of a flow chart for a fruit and vegetable-processing company, from reception and market orders to obtaining the customer's opinion of the product.

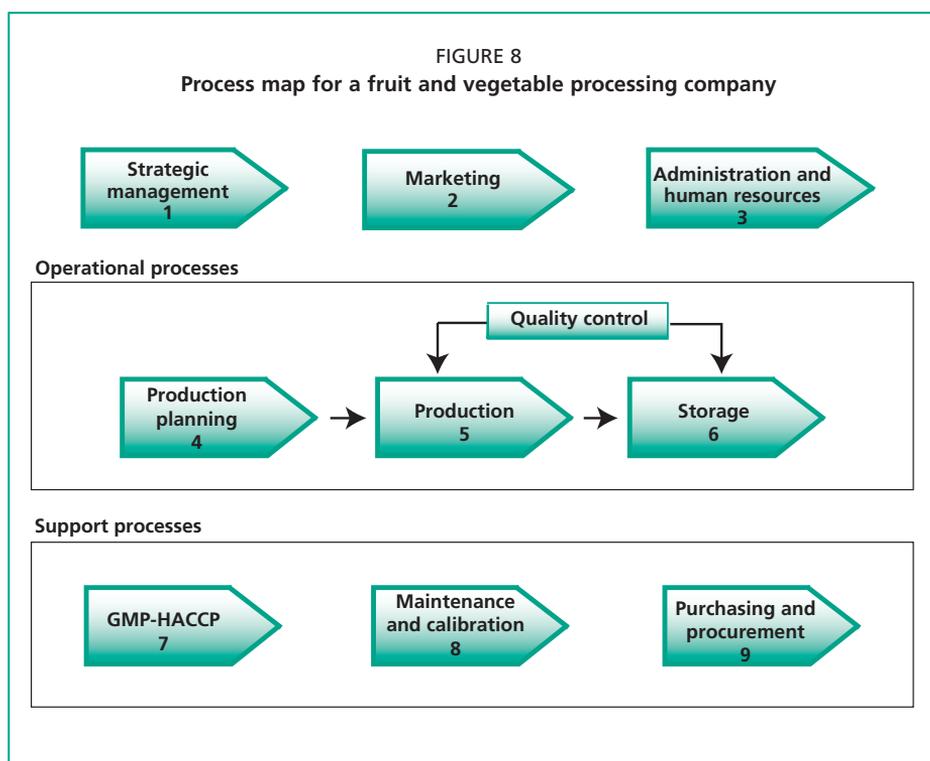
³ This methodology is based on:

- James Harrington. *Business Process Improvement Workbook* (1993)
- *Guidance on the concept and use of the process approach for management systems*. Document/TC. an(r) 13 May 2004. ISO/TC 176/SC 2/N 544R. 2005.



B. Identification and sequencing of processes

After establishing the flow chart of activities, they are grouped into processes. A useful tool for grouping these processes is the process chart. The process chart



is a graphic representation of the structure of the processes making up a system. Processes are grouped on this chart to identify similarities between processes and to facilitate an understanding of the interrelation and interpretation of the group. Identify and select the most significant processes that form the structure of the system. This is done by analysing the different activities relating to the process and determining how each of these activities influences the results or products.

Figure 8 is an example of a process chart for a fruit and vegetable-processing company. In this case, the processes have been grouped according to their function:

- management or strategic
- operational
- support

C. Identification of priority processes for achieving specific objectives

Determine or define the most important processes for achieving one or more specific objectives. The assessment matrix provides criteria for determining key or priority processes. Appendix 8 gives an example of a methodology used to select priority processes in a company. Although this methodology can be used for any type of company, given the difficulties of small and medium enterprises that are just starting up, we recommend defining the processes using a flow chart.

Step 2: Planning the process monitoring and assessment system

After the processes have been identified, you need to decide: (i) which activities are to be included; (ii) how they are to be implemented; (iii) if the necessary resources are available; (iv) if responsibility has been established; (v) if a performance indicator (or indicators) has been identified and (vi) how efficiency will be assessed. This is called planning.

Planning consists of the following steps:

- definition of activities in each process;
- description of the process;
- identification of the tools for monitoring and assessment, i.e. how performance is to be measured and assessed.

For each process:

- define the inputs and outputs;
- define the activities required to transform the inputs into the desired outputs;
- identify and define the sequence and the interactions between the activities in the process.

Again taking the example of the fruit and vegetable-processing company, Appendix 4 provides specifications for the activities relating to the nine processes set out in Figure 8 above. The description of the processes identifies the objectives fulfilled by each process and defines the instruments that are (or will be) used to monitor the system and assess its efficiency. A simple way to describe the processes is to use a 'process card', which contains the information in Table 3. Appendix 5 gives further examples of process cards and the interaction between processes.

Step 3: Monitoring and assessment of the process

Once the definition of the processes and planning activities, instruments, monitoring and assessment has been finalized, the next step is to implement them.

Monitoring involves the measurement and continuous observation of the process in order to ensure that it is functioning efficiently and according to plan. This is the basis for ascertaining to what degree the desired results are being achieved and where improvements should be targeted. Monitoring controls:

- the capacity of the company, system or process to make a product that meets the requirements (e.g. the production area delivers 90 percent of its products on time);
- the effectiveness of the process (the time it takes to carry out activities and to achieve the planned results);
- whether results conform to the process objective;
- the efficiency of the process (the appropriate use of resources in relation to the result obtained).

Step 4: Improving the process based on monitoring and assessment

This entails analysing the monitoring and assessment data in order to quantify the performance of the process. Once the level of fulfilment of the process

TABLE 3

Components of the process card

Process card: description of the process and the mechanisms for analysing and evaluating its capacity and effectiveness in achieving the company's objectives	
Objective of the process	The objective answers the questions: What is the reason for the process? Why does this process exist?
Indicators	Used for measuring and monitoring the evolution and trends in the process in relation to the objective.
Scope	Establishes the first (start) and the last (end) activity in the process.
Documents and records relating to the process	Provide data on the conformity between the process and the products. Procedures for each activity and monitoring and measurement records are included.
Procedures	The step-by-step description of how each activity in the process is carried out. This makes it possible to obtain a consistent result. For example, when the person in charge is absent, another person can carry out the activity by following these same procedures.
Person in charge	This person is responsible for achieving the objectives, monitoring the process control variables and coordinating with suppliers to ensure the efficient operation of the process.
Resources	Personnel, infrastructure, work environment and other requirements to ensure proper operation of the process.
Inspections	Systematic reviews of the process as a means of control.
Control variables	For identifying where action can be taken to control the process.
Failure conditions	The principal conditions or results that indicate that the process is not meeting the objective.
Interaction with other processes	Identifies the supplier and the inputs for the process, as well as the outputs or the results, and what or who is the client of the process.

requirements has been assessed, the company can focus its efforts on defining corrective measures and on optimizing the processes to achieve the highest possible efficiency. This requires a continual repetition of the PDCA cycle to identify faults or areas for improvement, to plan and implement actions and to check results.

The following section contains guidelines for the continual improvement of quality and safety management in an agro-industrial company.

CONTINUAL IMPROVEMENT

The continual improvement approach can be applied to all types of company process: operational, support, strategic and management. Continual improvement focuses on different objectives: (i) increasing the efficiency of the process; (ii) reducing costs; (iii) reducing defects; (iv) reducing the impact of the process on the environment; (v) reducing waiting times; (vi) increasing customer satisfaction; (vii) reducing the risks of product contamination and deterioration; (viii) making maximum use of staff capacity and (ix) keeping the staff motivated and committed to the company.

It is important to understand that the continual improvement approach deals not only with improving ongoing activities but also with new ways of carrying them out, as well as investigating new processes. This involves examining many changes

where success depends to a large degree on the cooperation and commitment of everyone working in the company.

According to standard ISO 9000:2000, continual improvement is a recurring activity used to increase the capacity to meet requirements. Perez (2003) breaks down this term as follows: (i) 'process' implies a related sequence of actions (steps) and not just a group of ideas; (ii) 'improvements' means that this sequence of actions increases the company's profitability, based on variables appreciated by the market (including quality and service), which give the company an advantage over its competitors and (iii) 'continual' means that, in a competitive environment where rivals attempt to improve their market position, advantages must be constantly developed.

Exercise

HOW IS A CONTINUAL IMPROVEMENT PROJECT STARTED IN A COMPANY?

The pathway to improvement is based on the PDCA concept, details of which are given in Appendix 6. This is a structured sequence for solving problems and defining actions.

COMPLETING THE CASE STUDY

After reviewing the content of the theme and comparing it with your own experience, review your answers to the initial questions and try to correct or supplement them. Link your answers to the topics covered in this section.

APPLYING THE EXERCISES

Complete the following exercises to improve your understanding of Theme 3, and try to apply the concepts developed in the context of your company.

1. Apply the process approach in your company as follows:
 - Identify a process in your company and characterize the inputs and outputs of the process, e.g. the raw materials and support services and the results of the process.
 - Draw a flow chart of the activities involved in the process. For each activity, identify possibilities for improvement.
 - Prepare a process card.
 - Apply the steps of the pathway to improvement. Prepare a proposal to implement the improvement.
2. A company is applying good manufacturing practices to its operations. However, during a three-month period of monitoring two work shifts, it was observed that operators were behaving incorrectly.

The following chart shows the situations encountered, together with their frequency of occurrence. Evaluate the corrective measures that could be implemented to solve these problems. When identifying corrective measures, apply the principles of the pathway to improvement explained in Appendix 6, Figure 1. Describe in detail how you would implement the corrective measures identified to make operators aware of the importance of safety and their contribution to achieving the company's objectives.

Description of the problem	Frequency	Corrective measures
The operators do not cover their hair completely	5	
The operators wear rings and earrings during processing of the product	8	
Operators use the same utensils for raw and cooked products	48	
Operators do not wash their hands after handling soiled material	12	
Operators do not adequately clean their shoes	67	
Operators consume foods in the plant during work time	8	
Operators leave product waste on the tables	3	
Others	2	
Total	153	

**MODULE
3**

Assessment of the theme

Additional pages may be used to answer these questions and instructions.

1. Applying the process approach in your company, identify the processes, draw them on a process flow chart and illustrate the interrelations between them....
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2. If the objective is to improve the quality of your product, how would you identify the key processes?
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3. Define in your own words the steps required to apply the process approach.
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4. State three reasons for applying the process approach in your company.
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.....

5. Describe the relationship between the PDCA cycle and the pathway to improvement.
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.....

6. Continuous improvement in a company leads to excellence. What are the reasons for this?
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7. Present data and facts about your company that demonstrate an opportunity for improvement.
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Summary

MODULE 3

- The process approach is a tool that establishes how to manage the company's activities in a coordinated way, improving the satisfaction not only of customers, but also of the owner, employees, suppliers and society as a whole.
- The process approach entails listing all the company's activities, deciding which are key to satisfying customer requirements (quality, safety, functionality, etc.), and representing them as processes that have inputs (requirements by internal and external clients, regulations and resources) and are transformed through a series of activities into outputs or results (final or intermediate products, services). The outputs or results are the used as inputs to other processes. In this way, one process is connected to another to form a system and a network of processes and their interactions can be created and understood.
- The system approach allows:
 - systematic identification of the activities that make up a process;
 - identification of relationships with other processes;
 - definition of responsibilities for each process;
 - analysis and measurement of the capacity and efficiency of the process;
 - focusing of resources and methods for improving the process.
- Continual improvement is a recurring activity to boost the capacity to fulfil specific requirements.
- In the process of continual improvement, the company should focus on understanding the needs of its customers, both internal and external (given that their needs are constantly changing), and implement tools to anticipate these changes and convert them into opportunities for improving competitiveness.
- A constantly applied PDCA cycle is a tool for organizing improvement activities that avoids the need for improvisation and minimizes inconsistencies. The four steps of the PDCA cycle are: planning, doing, checking and acting.
- The pathway to improvement is a technique that uses a structured sequence of seven steps to solve problems and requires a working group to be formed to lead it.

Theme 4: Quality and safety management, starting with suppliers

INTRODUCTION

Globalization and the resulting increase in competition have precipitated various changes in the way agro-industrial companies relate to their suppliers, final customers and other enterprises participating in the business, as well as to their competitors. The process approach and the food chain approach must include suppliers of inputs and services because they are critical to the company's success. One of the eight principles of the system approach to quality management is mutually beneficial supplier relationships. This new form of cooperation and integration of the enterprise with its suppliers, with other companies competing in the same field and with buyers or customers has proven to be a powerful means for gaining a competitive advantage in the global arena.

This theme illustrates the importance of implementing cooperation and coordination mechanisms throughout the product supply chain, from farm to fork. It focuses on supplier/company relationships as a key aspect for improving quality and safety management within agro-industrial enterprises. It also provides a selection of tools and techniques for enhancing the company's commercial relationships with its suppliers to improve the effectiveness of raw material supply processes.

EXPECTED RESULTS

By the end of this theme, participants should have a better understanding of the importance of:

- strengthening relationships between an agro-industrial enterprise and its suppliers as a strategy for assuring the quality and safety of raw materials;
- defining clear criteria for selecting suppliers in order to ensure a supply of raw materials of consistent quality delivered at the appropriate time;
- developing equitable relations between an agro-industrial enterprise and its suppliers, based on mutual benefit, as a strategy for the company's competitiveness and sustainability.

SUPPORT MATERIALS

Case study 1: Experience of contracting in a juice-producing company (vertical coordination)

Case study 2: The *Labradores Maya* producers' cooperative in Guatemala (horizontal coordination)

Reading for the theme: Quality and safety management, starting with suppliers

PowerPoint presentation: Theme 4

Case study 1**M
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Experience of contracting in a juice-producing company

Background

A company with a long history of fruit juice production began to establish contracts with producers to ensure a supply of excellent quality raw materials. This approach was unusual as there was no commercial production of the required fruit in the area.

Development

The contracts stipulated a fixed price, a compulsory requirement to sell a defined percentage of fruit to the company, quality specifications and, in some cases, included a commitment from the company to provide free technical assistance and inputs to the producers. The company began by concluding individual contracts with 90 producers for the production of blackberries and around 100 producers for passion fruit.

Problems

Nine months after initiating the contract programme, several problems emerged. The company's logistical, technical and administrative capacity was insufficient to cope with 190 contracted producers. Problems with payment delays began to occur and discounts on delivered fruit failed to be processed on time. In addition, technical visits to producers became progressively less frequent because of the extensive production zone. Strong competition from intermediaries led to the collecting centres receiving only 55 percent of the contracted quantities of fruit. As a result of this experience, the company made a series of amendments to its contracts. The new scheme offered contracts with legally constituted producers' associations instead of individual producers. In addition, the company sought support from, and alliances with, institutions that could provide technical assistance in the production zone, as well as with public and private institutions to facilitate producers' access to credit. They also made progress with the technical training of groups and with marketing activities. This enabled the company to spread its risk and receive support from strong institutions in the region. Contracting directly with producers' associations reduced the costs of managing contracts.

Outcome

Today the company handles only produce purchasing contracts. However, the company's current scheme offers producers the opportunity to access information, technical assistance, credit and services through other entities.

Source: adapted from *Contratos y otras formas de concertación en frutas y hortalizas – Manual para multiplicadores*. SENA, 2002

Case study 2

The Labradores Maya producers' cooperative in Guatemala. From Tecpan to Wal-Mart Central America

Labradores Maya is the cooperative responsible for *Del Fresco* products, which are on sale in supermarket chains throughout Guatemala.

Background

Thirteen years ago, Mayan farmers would never have imagined that the products grown by their family would be the most sought-after products in today's market. Operating as a group of 74 partners, they are now one of the leading vegetable suppliers to the Wal-Mart chain of supermarkets in Central America.

Development

Labradores Maya is the cooperative that unites these farmers. According to one of the farmers, their *Del Fresco* is one of the most popular brands, not only in local stores but also in the export market. The small plots in the Chirijuyú district near Tecpan had previously been cultivated by individual farmers, growing chiefly beans and maize. Nowadays, they are one big farm and all produce the same vegetables. However, it took a huge effort for a group of small-scale farmers to reach both national and export markets.

The first major step was to sell to Wal-Mart Central America, which meant that the vegetables had to be certified as safe and free of contamination. One of the farmers commented that it cost a lot of money, but they did it. The second step was to convince the people working with them to change their habits. "It was not easy for them to wash their hands or use the latrines, but nowadays this is normal practice and they do it in their own homes, and it has allowed us to grow," said a farmer with satisfaction. Although they are all small-scale producers, together the 75 partners form a large company. The first order was for 40 boxes of lettuce. At that time this was a large volume and they felt discouraged, but now they deliver up to 500 boxes per week, which has converted them into a solid company.

Outcome

Today they sell vegetables (carrots, cauliflower, lettuce, celery, broccoli and beets) exclusively to Wal-Mart supermarkets in the region. The next step is to sell to the United States of America and Europe. They have an order from Canada to send a container of celery on a weekly basis. Last year, sales totalled 370 000 tonnes. This year's goal is to double that amount. The cooperative has received support from USAID for training producers and monitoring the enterprise's performance.

Source: *El Periodico* – Guatemala. Friday, 18 August 2006

CRITERIA FOR ANALYSING THE CASES

On the basis of your own experience as it relates to this case, reflect on the following topics:

Case 1

- Identify the principal benefits for the company and for the producers of integrating other institutions through contracts and alliances.
- From your own point of view, which factors led to success, in terms of: (i) long-term sustainability and (ii) cooperation between the buying company and its suppliers?

Case 2

- What motivated producers to pool their resources and form the *Labradores Maya* cooperative?
- Identify the principal benefits of this cooperation model for partners that both produce and market their products.

The same questions are posed at the end of this theme so that they can be answered using the newly acquired knowledge.

Reading for development of Theme 4**Quality and safety management starting with suppliers****INTRODUCTION**

Agrifood systems have undergone profound changes in the last decade, partly as a result of increasing demand from consumers and customers for better food quality, safety and traceability. Against this background of deep-seated change, any competitiveness strategy must reject isolation and seek alliances and partners with which to work towards common objectives.

One of the pillars of the strategy of any food company wishing to be competitive in a specific market should be the ability to offer products of consistent quality to meet the buyer's volume and frequency requirements, while causing no harm to the consumer. Similarly, strategies that reduce the uncertainty associated with identifying a market or customers for the company's products are essential for improving the company's competitive position in a specific market. Mechanisms for cooperation between an agro-industrial company and the various actors with which it interacts are key to improving the management of processes that are vital to the company but are not under its direct control.

The development of competitive advantage for small and medium enterprises – specifically for the achievement of quality and safety objectives – is based largely on the company's capacity to develop cooperation networks with its external suppliers, with other companies in the business and with the buyers of its product(s). Normally, small and medium businesses choose their suppliers on the basis of personal relationships, proximity or the ease of obtaining the required inputs.

Most small and medium enterprises rely on a single supplier for any specific input. However, such enterprises have no procedure for selecting and evaluating suppliers of inputs or services critical to the company's business. This can lead to inefficiencies and can affect its product quality and safety. In addition, suppliers that provide inputs or services to the agro-industrial enterprise are likely to have no understanding of quality and to be unaware of the importance of their product or service in the agrifood chain.

Examples abound of agro-industrial enterprises that have had to approach their suppliers to: obtain guarantees concerning the safety of their packaging materials; analyse the composition of fertilizers to ensure that there is no safety risk from heavy metals; ensure the application of good agricultural practices or

good manufacturing practices in the companies supplying raw materials (fruit and vegetables, additives, etc.). In the field of services, major efforts are being made to ensure the quality and safety of agro-industrial products, such as confirming that: (i) the transportation company has hygiene plans and controls for its freight carriers; (ii) the company providing refrigeration services also has a hygiene plan and complies with good manufacturing practices and (iii) personnel are trained to prevent cross-contamination of foods, etc.

In this new approach to quality and safety management, agro-industrial companies must understand the need to work more closely with suppliers, and suppliers must understand that they are part of the chain. Appendix 9 provides further information on the different aspects that an agro-industrial enterprise should consider when purchasing.

WHO AND WHERE ARE SUPPLIERS?

In many cases the number of suppliers has shrunk from a large number to just a few, and sometimes to one single supplier per product, such as suppliers of phytosanitary products, suppliers of paper for wrapping fruit and suppliers of cartons. When a transport service provider is required, there are often no contracts and in some cases it is unclear whether the vehicle involved is used for other purposes, such as for transporting manure or fertilizers.

As Modules 1 and 2 demonstrate, quality means not only complying with specifications, but also meeting the needs and requirements of all customers. In the past, each individual company was responsible for developing quality products but, nowadays, it is a joint commitment involving both the company and its suppliers.

HOW CAN A CULTURE OF PERMANENT RELATIONSHIPS WITH CRITICAL SUPPLIERS BE CREATED?

The first step is to understand the suppliers because they and their customers are responsible for the quality and safety of agro-industrial products. The customer (in this case the entrepreneur) has to specify and document clearly the required characteristics of the product or service. Both parties have to agree on how the product or service will be checked systematically in order to ensure that specifications have been met. It is advisable for the supplier and the customer to be totally independent. When there is a permanent relationship – whether for the supply of fruit and vegetables or for transport – it is best to have a formal contract between the parties. As this is uncommon in the agro-industrial sector, there should at least be a working agreement specifying the parties' obligations and responsibilities. The supplier should also make a commitment to deliver certain data to the customer, such as analytical results on the quality of cartons to be used for packaging fresh fruit and vegetables, or analytical results demonstrating the absence of heavy metals in fertilizers.

HOW ARE SUPPLIERS SELECTED AND ASSESSED? WHAT IS A RELIABLE SUPPLIER?

A supplier sells inputs to a company, such as raw materials, packaging, phytosanitary products and fertilizers, disinfectants, waxes for fruit, equipment and utensils. A supplier also sells services, such as transport, refrigerated storage, equipment maintenance, cleaning and disinfection.

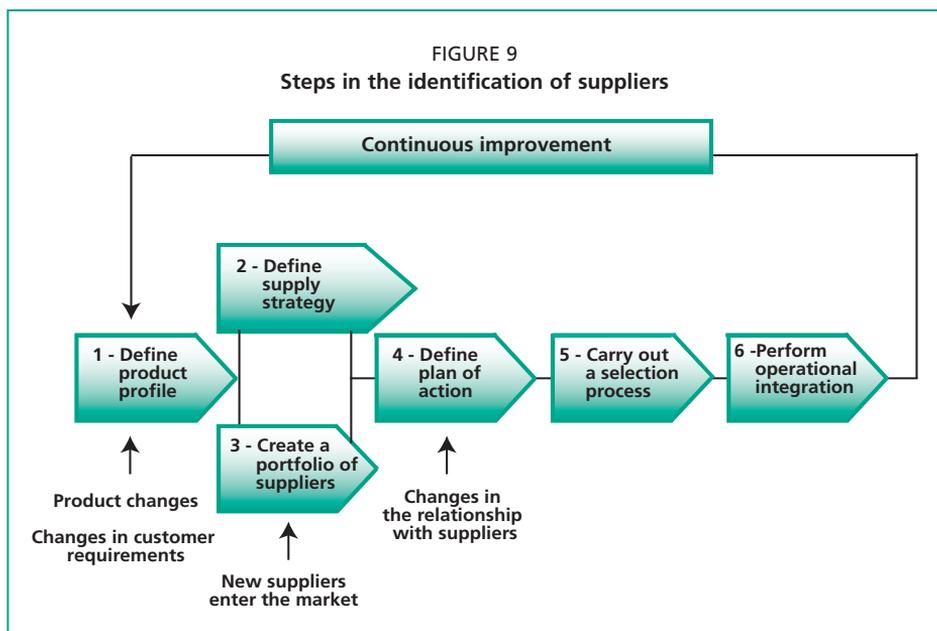
A reliable supplier is one that delivers a quality product on time at a fair price. Suppliers should not be considered merely as companies that respond to orders. The relationship with suppliers should not end with the delivery of the product or service. On the contrary, suppliers should be considered as an extension of the business or as strategic partners. Every company should therefore conduct a selection process to identify suppliers with which it can develop long-term relationships for the supply of inputs and services. Below is a description of some of the steps that an agro-industrial enterprise could follow to identify strategic suppliers.

IDENTIFICATION OF POTENTIAL SUPPLIERS

Figure 9 shows the steps that an agro-industrial enterprise should follow for identifying partners and strategic suppliers. The process consists of the six steps outlined below.

Step 1: Define the profile of the product to buy

Before searching for suppliers there must be a clear idea of which products or services are to be acquired or supplied in terms of quality and quantity. This



enables suppliers to be selected on the basis of their ability to provide products of the quality and quantity required by company policy. It is also necessary to identify which products the company buys and which ones are the most critical for achieving its objectives to produce or market safe, good quality products. All the inputs and services needed by the company should be listed, and those that have to enter the selection and assessment process should be determined. It is one thing to select a supplier of paper for administrative use or maintenance services for the company's transport vehicles, but quite another to select and evaluate a fresh-fruit supplier for jam production.

Step 2: Define the supply strategy

Certain elements should be taken into account, such as frequency of purchase, or the existence of a buying programme or documented specifications covering the quality, safety and quality control requirements. For fruit and vegetables, for example, establish if the supply of materials involves:

- written contracts with individual producers;
- verbal agreements with individual producers;
- contracts with producers' associations;
- direct purchase from wholesalers in the market;
- any combination of the above.

Step 3: Create a list of qualified suppliers (portfolio of suppliers)

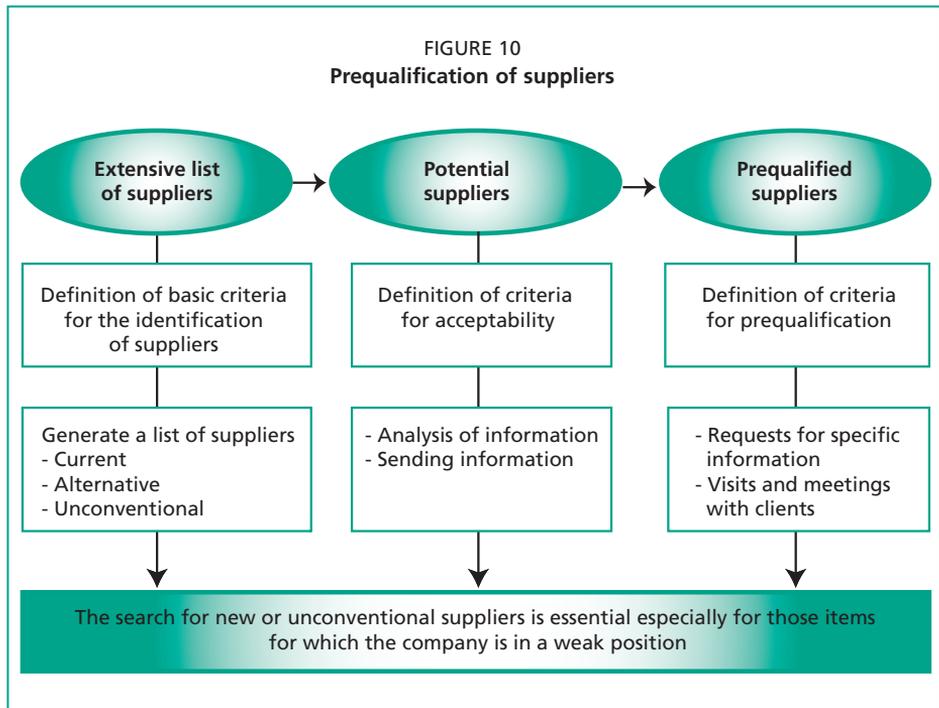
This entails selecting suppliers that have the potential or experience to satisfy the company's needs and requirements. Enterprises apply different criteria for the preselection of suppliers based on their supply strategies. Continuing with the example of the supply of fruit and vegetables, the criteria could be:

- the size of the cultivated area and potential for expansion;
- location in an area where there are suitable roads transporting the product to the plant;
- producers are organized into associations;
- application of good agricultural practices or certification.

Figure 10 illustrates the process for the prequalification of suppliers. Starting from a long list of suppliers, a shortlist of potential suppliers is produced and, finally, a list of prequalified suppliers is drawn up.

Step 4: Define criteria for the selection of suppliers and strategies for their development

Each company establishes criteria for the process of evaluation and scoring of suppliers. There is no established method. Section 7.4.1 of standard ISO 9000:2000, *Quality management systems*, states that the organization must evaluate and select suppliers based on their ability to supply products that meet the requirements of the organization. Criteria should be established for selection, evaluation and re-evaluation. Records should be kept of the results of assessments and of whatever action was taken as a result.



Supplier assessment is used to eliminate suppliers that do not meet the company's needs and expectations, as well as to motivate those that work with the company to achieve its quality and safety objectives. The criteria for the selection of suppliers include:

- **Strategic:** location, experience, availability, quality programmes, image, fulfilment and recordkeeping.
- **Technical:** infrastructure, staff training, vehicles, quality and safety of their products, technical assistance.
- **Commercial:** communication with the company, price, discussion of problems, attention to requirements, flexibility on deliveries, forms of payment.

Once the criteria for assessment and scoring have been established, a table is prepared to assess how well each supplier satisfies the established criteria. The opinions of the employees involved in placing orders, reception, use and storage of the inputs, as well as the opinions of the direct users of the service, are taken into account. For example, if cartons are to be used for packing fruit, the manager in charge of purchasing will give an opinion on how speedily the supplier deals with budgets or agrees on deliveries, and the plant manager will score the quality of the product (e.g. whether it breaks or tears during use and whether the printing

complies with the order). The manager in charge of shipping the final product could give an opinion on the quality of the packaging when observing the complete pallet. Making use of staff knowledge and experience is crucial to the selection and assessment process. Appendix 10 details reasons, benefits and steps to follow in establishing cooperation between actors.

Step 5: Selection of suppliers

In this step, the score for each supplier is determined according to the answers obtained and the score assigned to each answer. Suppliers are grouped into categories for defining and validating their fulfilment of the company criteria for supplier selection. This also identifies the strategies needed to assist suppliers in resolving critical quality and safety problems. These include the provision of training and technical visits to the company, as well as visits by technical staff in the field and the programming of technical inspections. Appendix 11 provides more detailed information on systems for the confirmation of suppliers.

Step 6: Establish operational integration between the client and a supplier

Finally, suppliers that have been evaluated and selected are included in a list of approved suppliers that will provide inputs and services to the company. These are the suppliers with which it is desirable to work in implementing the strategies for continual improvement.

To facilitate the assessment task, two examples of supplier criteria, scoring and final qualification are presented below. A card should be prepared for each critical supplier (Table 4). The first format can be used by companies that are already working with management systems and/or have personnel for carrying out this task. The second format is more basic and is suitable for small companies with little or no experience of this process. In small companies that are just starting up, a simplified assessment is adequate. This takes into account the quality of the product or service, the price, the delivery service, complaints and attention (Table 5).

Step 7: Re-assessment of suppliers

Companies are increasingly adopting the practice of re-evaluating suppliers. This involves frequent evaluation of their performance to check that suppliers are maintaining their ratings and, if this is not the case, to identify where improvements are required. Re-assessment reports should be communicated to suppliers in a clear and coherent way so that they can take action to correct any problems. Re-assessment of suppliers is typically carried out on an annual basis but may be more frequent. The frequency and the methods used depend on the type of input or service involved and its importance to the customer.

TABLE 4

Example of criteria used by a company to assess its suppliers

		EVALUATION CARD BY SUPPLIER					
ASPECTS	Name of supplier:						
	CRITERIA	SCALE 1= unsatisfactory 5= very satisfactory					SCORE
		1	2	3	4	5	
STRATEGIC	Experience						
	Availability						
	Quality						
	Image						
	Improvements						
TECHNICAL	Infrastructure						
	Personnel						
	Equipment						
	Operations						
COMMERCIAL	Customer service, compliance with delivery times						
	Communication with the customer						
	Planning						
	Price						
	Response to complaints						
	TOTAL						

EVALUATION CRITERIA	
Concept to evaluate	How
Product or service quality	Quality below market level: 1 Quality at market level: 3 Quality above market level: 5
Price	Price above market: 1 Price at market level: 3 Price below market: 5
Readiness to find solutions	Does not find solutions: 1 Finds solutions: 3 Finds many solutions: 5
Compliance with delivery deadlines	Delivers late: 1 Variable – Delivers 1 out of 10 late: 3 Always on time: 5
Response to complaints	Does not resolve complaints: 1 Resolves complaints but outside deadline: 3 Resolves on time and correctly or there are no complaints: 5
Quantity of complaints	Many (5 to 10): 1 Few (less than 5): 3 None: 5
Planning	Incorrect planning (time and form): 1 Correct but some mistakes (time and form): 3 Very satisfactory (time and form): 5

SCORE	EVALUATION	FOLLOW-UP ACTION
60 – 70	Very reliable	Acceptable-review weak points
40 – 60	Conditional	Work on an improvement plan
Less than 40	Not reliable	Not acceptable

TABLE 5

An example of assessment of suppliers in a small company without experience in supplier development

Criteria	EVALUATION CARD BY SUPPLIER		
	Evaluation	Score	Total
Quality			
Price			
Service			
Attention			
Evaluation score			

Exercise

COMPLETING THE CASE STUDY

After reviewing the content of the theme and comparing it with your own experience, review your answers to the initial questions and try to correct or supplement them. Link your answers to the topics covered in this section.

APPLYING THE EXERCISE

Apply the knowledge you have acquired on the selection and assessment of suppliers to the processes in your company by carrying out the following steps:

1. List all the inputs purchased by your company.
2. Prioritize those that are of most interest for the quality and safety of your product, and include services.
3. Prepare a table using criteria that you would use for selecting and evaluating your suppliers.
4. Indicate in which way this information is valuable for your company’s purchasing operations and for producing safe, quality products

To improve your understanding of the content of this theme and to evaluate its practical application, we suggest that you carry out the following exercise on the assessment and selection of suppliers. The exercise can be carried out in groups or individually.

1. Read carefully the situation described above.
2. Choose the two transport companies that you consider to be the most suitable, taking into account the information provided in Table 6.

Description of the situation

A food company needs to subcontract its transport services; this is a critical aspect for customer satisfaction. The company dispatches products nationwide, as follows:

Zone	Percentage of orders
South	40
North	30
Centre	30

The management proposes to choose two suppliers. Descriptions of three potential suppliers are given in Table 6, together with details of the bids they presented. They all offer the same transport tariffs. For the company it is essential that there should be no delays or hold-ups in delivery services.

3. Prepare a matrix for the assessment of suppliers. Define the assessment criteria and assign a score to each criterion explaining your reasons.
4. Share the results of your analysis and your decision in the plenary session.

TABLE 6
Summary of potential suppliers

Topic	Candidate 1	Candidate 2	Candidate 3
Experience as a supplier	8 years	6 years with the company	2 years with the company
Vehicles	50% of operations are subcontracted	80% transport equipment is owned; 20 percent is subcontracted	70% of operations are subcontracted
Quality management systems	No known model of support	No known model of support	ISO 9001:2000
Staff training	Defensive driving (drivers) Customer service	Defensive driving (drivers) Customer service	All staff trained Subcontracted personnel given 20-minute briefing before each dispatch
Performance	98% in 2004 96% in 2003	95%	92% in 2004 82% in 2003
Attention to complaints for non-delivery	Attention to all complaints	Some complaints have not been dealt with (deterioration). Complaints for non-delivery have all been dealt with	All complaints for non-delivery and deterioration have been dealt with
Delivery delays	18% of all deliveries for vehicle problems 4% for other reasons	12% for vehicle problems 4% for other reasons	No delays
Ease of communication	Telephone contact	Manager visited the enterprise to learn of needs and perceptions	Driver hands out a survey to each customer to evaluate their service on each dispatch
Location	120 km from the company's headquarters	5 km from the company's headquarters	10 km from the company's headquarters

Assessment of the theme

Additional pages may be used to answer these questions and directions.

1. Why is it important for companies to recognize that their suppliers are strategic partners?

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2. Do you consider yourself a partner or a strategic supplier? Explain your answer.

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3. List the actions your company undertakes to strengthen and improve relations with its suppliers.

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4. Identify five criteria that are essential in the evaluation of suppliers.

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5. How do you think the current evaluation system for suppliers could be improved in your company?

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Summary

- Mechanisms for cooperation between an agro-industrial enterprise and the various actors with which it interacts are key to improving the management of processes that are vital to the company but are not under its direct control.
- The development of competitive advantage for small and medium enterprises, especially for improving quality and safety, is based largely on the company's capacity to generate cooperation networks. These should be developed with its suppliers, with other enterprises in the business and with buyers of its products.
- The new process approach to quality improvement means that buyers must work very closely with their suppliers to identify the main factors that prevent compliance with quality requirements. It also means supporting suppliers in implementing measures for preventing and controlling possible causes of deterioration in product quality and safety, starting in the field.
- Suppliers should consider themselves as an extension of the company and as strategic partners. The company must develop processes that allow it to identify suppliers with which it could develop long-term relationships for the supply of raw materials.
- Quality control at reception is one of the most important steps in quality management within a company. To a great extent, the quality of raw materials determines the quality of the final product. Quality control requires planning, research, administration and discipline, together with regular training and the revision of procedures.
- The supplier identification process consists of the following steps:
 - define the profile of the product to buy;
 - define the supply strategy;
 - create a list or portfolio of qualified suppliers;
 - define criteria for the selection of suppliers and strategies for their development;
 - carry out a systematic process of supplier selection;
 - encourage the operational integration of the client and the supplier.

References

THEME 1

- D'Alemán, C.** *Principios de calidad*. (No date given). Article available in Spanish at www.mollabs.com/archivos/calidad.pdf.
- Díaz, L.** 2006. Personal interviews with producers.
- IRAM.** 2000. ISO 9000-2000 *Las normativas del Milenio. Principios de calidad*. Instituto Argentino de Normalización y Certificación (IRAM). Buenos Aires.
- ISO.** 2000. ISO 9000. International standard certified translation. *Quality management systems. Concepts and vocabulary – Principles of quality*.
- McGillivray, G.** 1998. *Análisis económico e investigación de mercados para proyectos hortofrutícolas. Manual de capacitación*. Servicio Nacional de Aprendizaje (SENA), Armenia, Colombia.
- SENA.** 2000. *Memorias III simposio internacional de competitividad en frutas y hortalizas*. Servicio Nacional de Aprendizaje. SENA. Armenia, Colombia.
- SENA.** 2002. *Contratos y otras formas de concertación en frutas y hortalizas. Manual de capacitación*. Servicio Nacional de Aprendizaje (SENA). Armenia, Colombia.

THEME 2

- Cabrera, T.** 2001. *Motivación en las empresas uruguayas*. Article available in Spanish at www.gestiopolis.com/recursos/documentos/fulldocs/rrhh/moturu.htm
- Díaz, L. & Pedraza, R.** 2001. *La gestión empresarial hortofrutícola*. Servicio Nacional de Aprendizaje (SENA). SEMMIS project, Armenia. Colombia.
- Fairbanks, M. & Lindsay, S.** 1997. *Arando en el mar. Fuentes ocultas de la creación de riqueza en los países en desarrollo*. Ed. McGraw-Hill. Colombia, 2000.
- Government of Chile.** 1999. *Premio Nacional a la calidad de los Servicios Públicos. Bases del P.N.C. 1999. Conceptos esenciales*. Santiago de Chile. Article available in Spanish at www.dipres.cl/control_gestion/PMG/Documento_Bases_Guia_P_Calidad.html.)
- Hernández, J.** 2003. *El liderazgo como factor clave en la cultura de calidad*. Fundación Latinoamericana para la Calidad (FLC), Biblioteca Virtual. Article available in Spanish at www.calidad.org/public/arti2003/1058305335_joseju.htm.
- Muñoz, J.** 2006. *El liderazgo, clave del éxito de la implementación del sistema. HACCP en la empresa ZEMUSA*. Peru 2006.
- OEA-GTZ.** 2000. OEA-GTZ Project – *Gestión de la calidad en pequeñas y medianas empresas. Un ejemplo de liderazgo: la empresa DELIS de quesos de la Ciudad de Chorrera*. Panamá.

Links and complementary documents

LINKS OF INTEREST

Recommended Links

<http://gaif08-blog.mediavince.com/?lg=en&topicId=15>

<http://www.qlif.org/>

http://www.iso.org/iso/iso_catalogue/management_standards/iso_9000_iso_14000/more_resources_9000/9001supchain.htm

http://isotc.iso.org/livelink/livelink/fetch/2000/2122/687806/ISO_TC_176_Quality_management_and_quality_assurance_.pdf?nodeid=852656&vernum=0
<http://isotc.iso.org/livelink/livelink/fetch/2000/2122/138402/755901/1069636/customview.html?func=ll&objId=1069636&objAction=browse&sort=name>

DOCUMENTS OF INTEREST

Theme 3

ISO. 2000. ISO 9000 International standard certified translation. *Quality management systems. Concepts and vocabulary – principles of quality*. ISO 2000.

ISO. 2001. *Guidance on the process approach to quality management systems*. Document: ISO/TC 176/SC 2/N 544R. May 2001.

ISO. 2004. *Introduction and support ISO 9000: Guide on the concept and use of the process approach for management systems*. Document: ISO/TC 176/SC 2/N 544R2(r). 13 May 2004.

Tetsuichi, A. & Ozeki, K. 1990. *Handbook of quality tools: the Japanese approach*. Ed. Cambridge Mass Productivity Press.

Appendix 1

Recommended further reading on the themes of Module 3

THEME 1: PRINCIPLES OF QUALITY MANAGEMENT IN SMALL AND MEDIUM AGRO-INDUSTRIAL ENTERPRISES

Reading 1: Revolution and evolution

Author: Alderete, J.M. & Fuxman, A.

Published by: *Secretaría de Agricultura, Ganadería, Pesca y Alimentos – Ministerio de Economía e Producción, República Argentina.*

Document:

http://www.alimentosargentinos.gov.ar/0-3/revistas/r_35_especial/articulos/revolucion_evolucion_ingles.htm

Description

The promotion and improvement of agrifood quality has been one of the functions of the National Food Administration since its creation. Although actions aimed at this objective began more than 10 years ago, the birth of the 'Argentine Food Quality' Programme (PROCAL), coordinated by the Under-secretariat of Agricultural Policy and Food in 2001, marked the beginning of a period that widened and deepened the scope of this programme.

THEME 2: LEADERSHIP, THE KEY TO IMPROVING FOOD QUALITY AND SAFETY

THEME 3: THE PROCESS APPROACH AND CONTINUAL IMPROVEMENT – EFFECTIVE TOOLS FOR FOOD QUALITY AND SAFETY MANAGEMENT

Reading 1: Guidance on the process approach to quality management systems

Published by: International Standards Organization (ISO)

Document:

ISO/TC 176/SC 2/N 544 R., May 2001.

Reading 2: How to implement a food safety management system

Author: Frost, R.

Published by: International Standards for Business, Government and Society. ISO 2006.

Document:

http://www.iso.org/iso/food_safety_frost.pdf

Description

This document describes the application of the various quality standards published by ISO and refers to various documents that help organizations to apply these norms.

Reading 3: A new process-based approach for implementing an integrated management system: quality, security, environment

Authors: Badreddine, A., Ben Romdhane, T. & Ben Amor, N.

Published by: International MultiConference of Engineers and Computer Scientists 2009 Vol II IMECS 2009.

Description

This paper presents a new approach to implementing and integrating quality, environment and security management systems on the basis of three aspects: a process-based approach, risk management and a global monitoring system used as integrating factors to satisfy three important levels of integration – correspondence, coordination and integration.

Reading 4: The quarterly quality report

Author: American Society for Quality, 2007.

Published by: American Society for Quality, 2007.

Document:

<http://www.asq.org/quality-report/reports/200706.html>

Description

The ASQ Quality Report provides a detailed look at a variety of quality-related topics and issues. The report is developed by the American Society for Quality in keeping with its role as the steward of the quality profession to promote the use of quality as a global priority, an organizational imperative and a personal ethic, and to promote quality concepts, technology and tools.

Reading 5: Productivity – theory and measurement in business

Author: Saari, Seppo.

Published by: Management Information Development Oy. 2006.

Document:

http://www.mido.fi/index_tiedostot/Productivity_EPC2006_Saari.pdf

Description

This paper is based on the book with the same title.

Reading 6: Guidelines on the process-based approach for quality management systems

Published by: International Standards Organization (ISO).

Document: ISO/TC 176/SC 2/N 544 R. May, 2001.

Description

This document provides a better understanding of the concept and the intentions of a process-based approach for quality management systems.

THEME 4 – QUALITY AND SAFETY MANAGEMENT STARTING WITH SUPPLIERS**Reading 1 – Business partnerships in agrifood chains**

Authors: Piñones Vázquez, S., Acosta Avila, L.A. & Tartanac, F. FAO Regional Office for Latin America and the Caribbean.

Published by: FAO, 2006.

Document:

<http://www.fao.org/ag/ags/programmes/en/agribusiness/Business.pdf>

Description

This document helps to consolidate business partnerships in agrifood chains in the region by analysing the results of project TCP/RLA/2905 *Support for the promotion and development of business partnerships*, implemented in Brazil, Chile, Mexico and Peru in the milk, castor bean, beef, avocado, lemon, mango, artichoke and lentil chains.

Reading 2: The food safety revolution

Author: Percy, B.

Published by: Food Quality, 2009.

Document:

http://http://www.foodquality.com/details/article/807865/The_Food_Safety_Revolution.html

Description

This article describes how a food safety management system can help the food industry comply with new safety initiatives.

Reading 3: Linking farmers to markets

Author: Rural Infrastructure and Agro-Industries Division of FAO.

Published by: FAO, 2007.

Web site:

<http://www.fao.org/ag/ags/subjects/en/agmarket/linkages/coops.html>

Description

On this Web site, nine case studies are presented under this category. Three (Argentina, Costa Rica and Guatemala) involve cooperatives that have developed agribusiness ventures with only limited external assistance. Other cooperative ventures (in Brazil, Guatemala, El Salvador, Haiti and two cases in Ghana) have benefited to a greater or lesser extent from external assistance by governments, donors or NGOs.

Reading 3: Establishing supply chain partnerships: lessons from Australian agribusiness

Author: O’Keeffe, M.

Published by: Supply Chain Management: An International Journal, 1998.

Document:

<http://www.emeraldinsight.com/Insight/viewContentItem.do?contentType=Article&contentId=858142>

Description

Many agribusiness firms in Australia are buying into the concept of SCM but are not sure how to apply it. This article provides some guidance for firms that are considering following the SCM path. It presents a checklist for auditing potential supply chain partners, which has proved useful in focusing the minds of potential partners on the key issues of trust and relationship management.

Reading 4: Safety in the agri-food chain

Author: Luning, P.A., Devlieghere, F. & Verhé, R.

Published by: Wageningen Academic Publishers, 2006.

Document:

<http://books.google.it/books?q=safety+in+the+agri-food+chain>

Description

Increasing public demand for an adequate and safe food supply has led to extensive development in the field of plant and animal production, food processing, quality and safety procedures, food analysis and control and regulations. However, food safety can only be guaranteed by the integration of control systems throughout the food chain ‘from stable to table’. This book covers the entire agrifood chain.

Reading 5: Agri-supply chain management

Author: Timmermans, T.

Published by: Wageningen UR, 2006.

Document:

http://www.unapcaem.org/Activities%20Files/A22/021_keynote.pdf

Description

PowerPoint presentation on Enhancing Export Competitiveness of Asian Fruits.

Appendix 2

The importance of teamwork in achieving company objectives

WHAT IS TEAMWORK?

Teamwork is defined as work carried out by a small number of people with complementary skills who are committed to the same objective, common planning and shared responsibility. The combined experience and talent of all the people working in a team is greater than the experience and talent that any one of them possesses individually; there is synergy.

DIFFERENCE BETWEEN A TEAM AND A GROUP

- A group is a collection of people with a common characteristic, for example, work companions or members of a club.
- A team is a group of people with a common mission or objective who work in a coordinated way, with the participation of all under the direction of a single leader; for example, a team of operators in a production line, or an improvement team.

BASIC RULES FOR A PROPERLY FUNCTIONING TEAM

- avoid competition between members of the team
- avoid manipulation
- know how to listen
- avoid taking a defensive position
- make sure that everyone participates
- synchronize everyone's activities while they participate in a given action

REQUIREMENTS FOR THE FORMATION OF WORK TEAMS

Cohesion

Groups have cohesion whenever belonging to them is considered positive and members feel attracted to the group. This can be considered from two points of view:

- a. social cohesion refers to the bonds of interpersonal attraction that unite the members of the group;
- b. task cohesion refers to the way in which the attitudes and skills of the group come together for optimal performance.

Social cohesion can be promoted by carrying out team-building activities such as:

- a. designing a logo or another type of identification for the team;
- b. sharing information on new jobs;
- c. promoting activities that reveal the common characteristics of members.

Task cohesion can be developed through activities that allow team members to evaluate their respective skills, strengths and weaknesses.

Assigning functions and standards

Standards are the rules that govern the behaviour of team members. By keeping to functions that have been explicitly identified, the team can carry out its tasks efficiently. It can be positive about carrying out activities that allow the group to discuss and agree on functions and rules for the team because this will guarantee their adoption.

Communication

Good interpersonal communication is vital to carrying out any type of task. Some experts suggest conducting exercises where members must listen to the others, and both give and receive information.

Identification of objectives

It is important for team members to have common objectives relating to their teamwork and for each member to specify individual objectives clearly. For this it is necessary to identify the team's mission and objectives.

Positive interdependence

Group learning is characterized by positive interdependence between members of the team, with each member responsible for their own learning, as well as the learning of the team as a whole.

Development of teams

Teamwork is the foundation of a modern company. The best approach to developing teams is to begin early and to be open and honest with all involved. Everyone needs to know that they are in the team for a particular reason and that their contribution is important. Team members should therefore document their ideas and strategies to create the final product. Then they should all meet to discuss their ideas and reach a consensus on a common plan of action. Once the plan has been established it is important to keep all participants involved through a continuous flow of information.

An example of teamwork and leadership

Kelly's Food Products won the 2005 Prize for Excellence in the Competitive Venezuela programme "Venezuelan success". Kelly's Food Products is a pioneering company involved in growing, processing and marketing of vegetables in Venezuela. It maintains high quality standards for all of its processes to guarantee customer and consumer satisfaction, as well as to preserve the environment. It was established by two young university graduates in 1984.

The reasons for selecting it as a successful case were as follows:

- Teamwork proactively focused on the customer and the mutual welfare of employees, commercial partners and shareholders.
- The leadership model focused on the achievement of objectives that contribute to continuous growth and development.
- Financing of 160 small producers in the Andean region, covering soil analysis and preparation, provision of plantlets according to soil characteristics, technical assistance, agricultural inputs and a guarantee to purchase the entire harvest.
- Direct livelihood for 800 people in the rural sector.
- Self-sufficiency in liquid and solid biofertilizer. Implementation of advanced technologies.
- Mechanical harvesting and a distribution chain throughout the country.

Appendix 3

Selection of priority processes for drawing up a company's process map

Table A3.1 presents a methodology for selecting priority processes. Even though the methodology is practical and useful, it is difficult to implement in small companies where:

- i. there is no business management development;
- ii. the producer is involved in all the processes;
- iii. there is a low level of identification and development.

However, the methodology can be very useful where an external consultant or extension worker is available and capable of guiding its implementation. That is why it is presented here as further reading for those who are interested. To illustrate this topic, the processes of an agro-industrial enterprise have been selected according to how far they contribute to meeting four specific objectives:

- fulfilling 95 percent of orders;

TABLE A3.1
Example of the method to identify priority processes that meet specific objectives

Processes	Objectives				Score: ● High = 10 points ■ Medium = 5 points X Low = 1 point		
	1	2	3	4	Impact of the process	Repercussions for customer	Total
1. Strategic management	■	●	●	■	30	10	300
2. Marketing	●	●	X	X	22	10	220
3. Administration and human resources	●	■	●	■	30	5	150
4. Production planning	●	■	●	●	35	5	175
5. Production	■	●	●	●	35	10	350
6. Storage	■	●	●	■	30	5	150
7. GMP-HACCP	■	●	●	■	30	10	300
8. Maintenance and calibration	●	■	■	●	30	5	150
9. Procurement and purchasing	●	■	●	X	26	5	130

Source: *Guide for identifying processes* (no date).

- customer satisfaction measured as a reduction in complaints of up to 90 percent;
- zero problems associated with product safety;
- 28 percent reduction in losses resulting from failure to meet quality criteria.

Processes with the highest scores are recognized as key or priority processes. In this example, those that made the greatest contribution to the four specific objectives were considered to be:

- i. strategic management;
- ii. variables relating to production;
- iii. the application of GMP programs;
- iv. the HACCP system.

Appendix 4

Description of each process and interactions between processes

DIAGRAM OF PROCESSES CARRIED OUT IN A FRUIT AND VEGETABLE-PROCESSING COMPANY

P1: Strategic management

P2: Marketing

P3: Administration and human resources

P4: Production planning

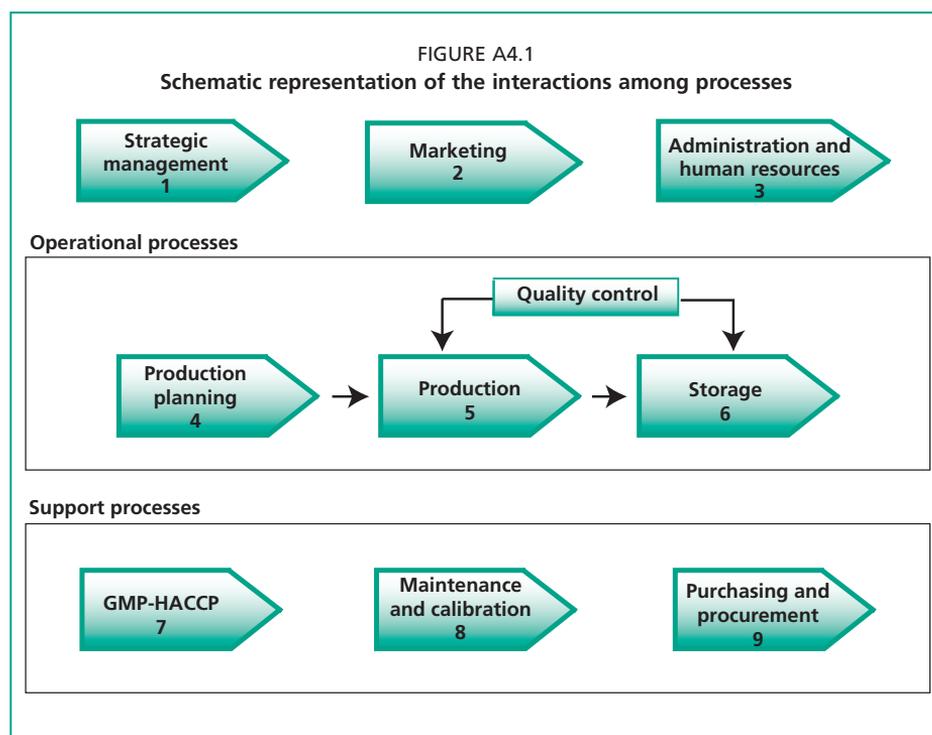
P5: Production

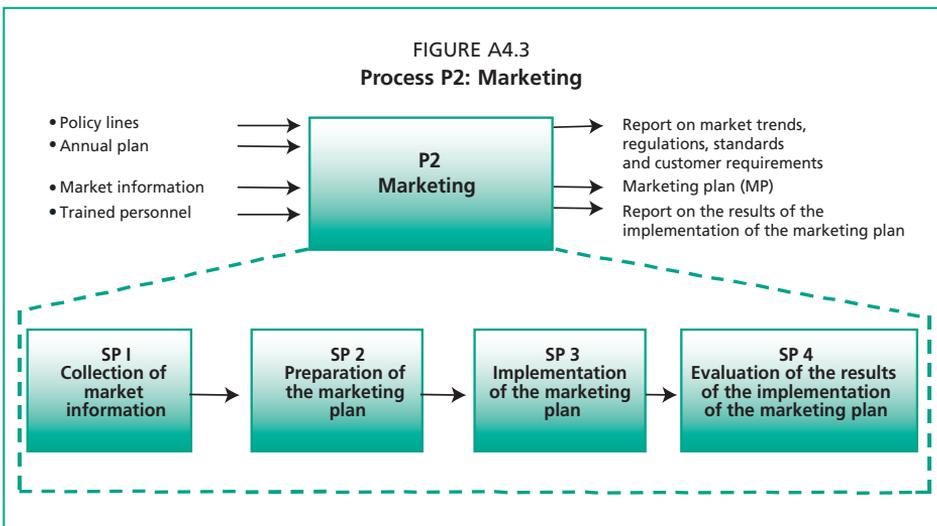
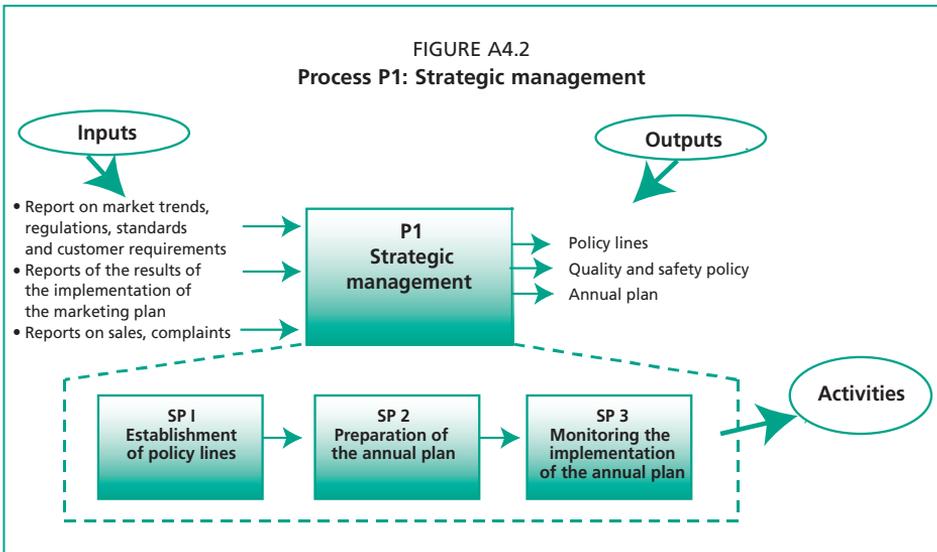
P6: Storage

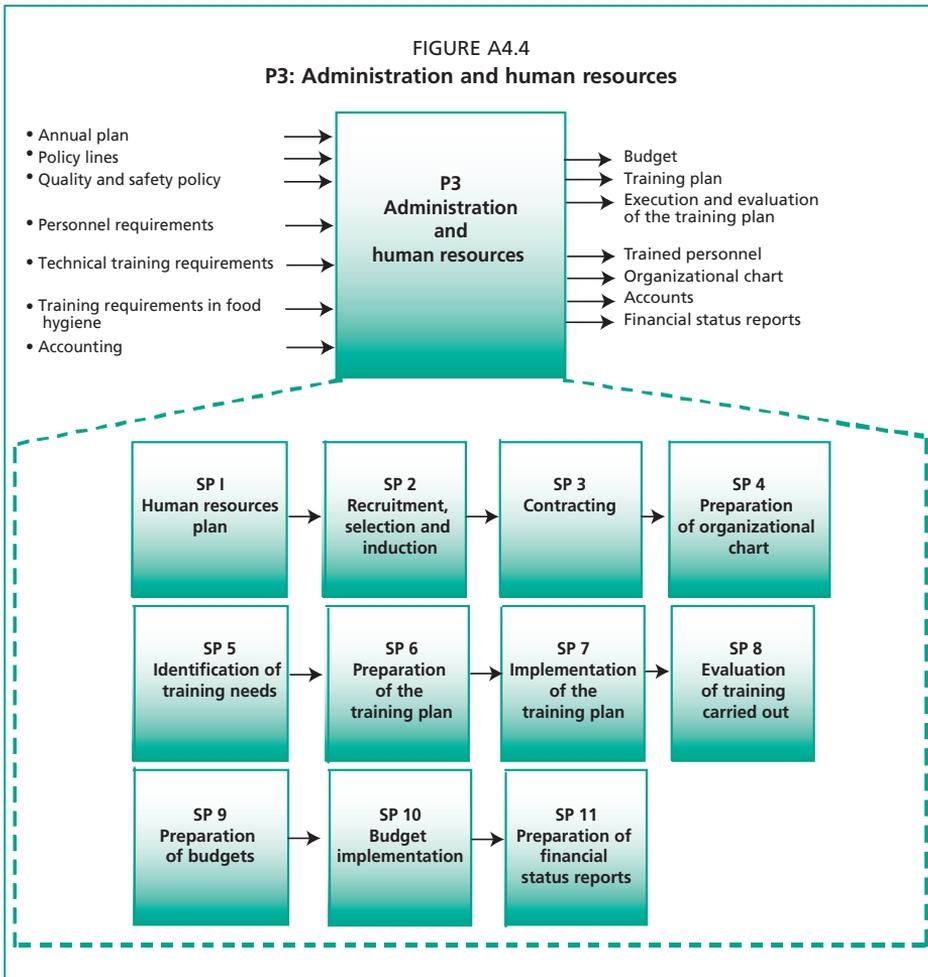
P7: Quality and safety assurance

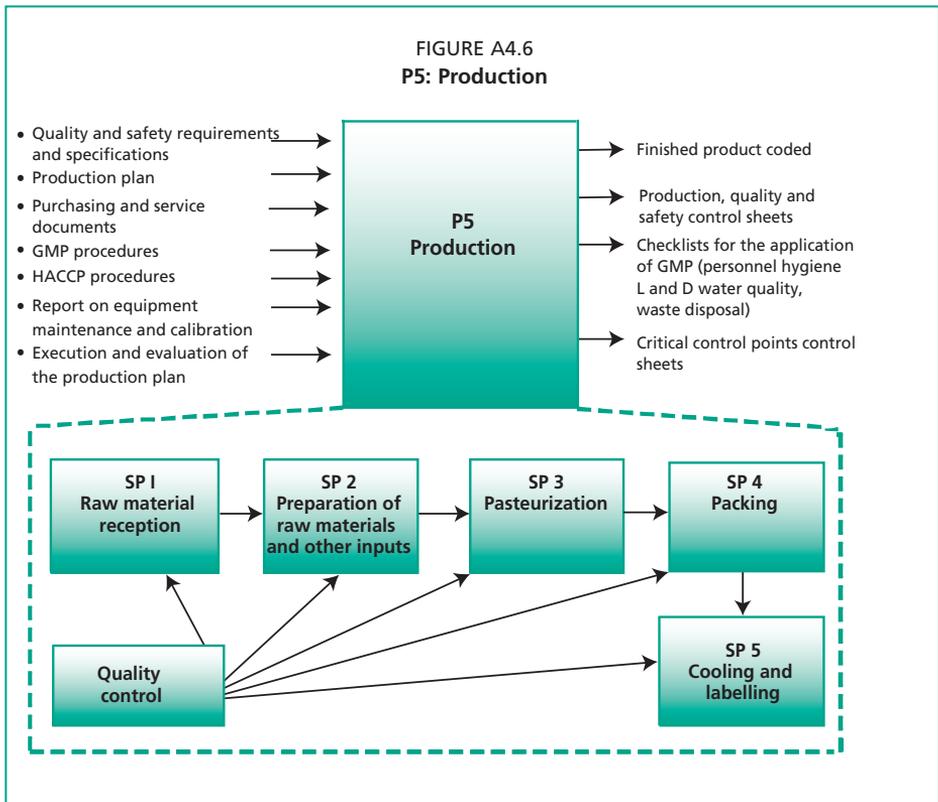
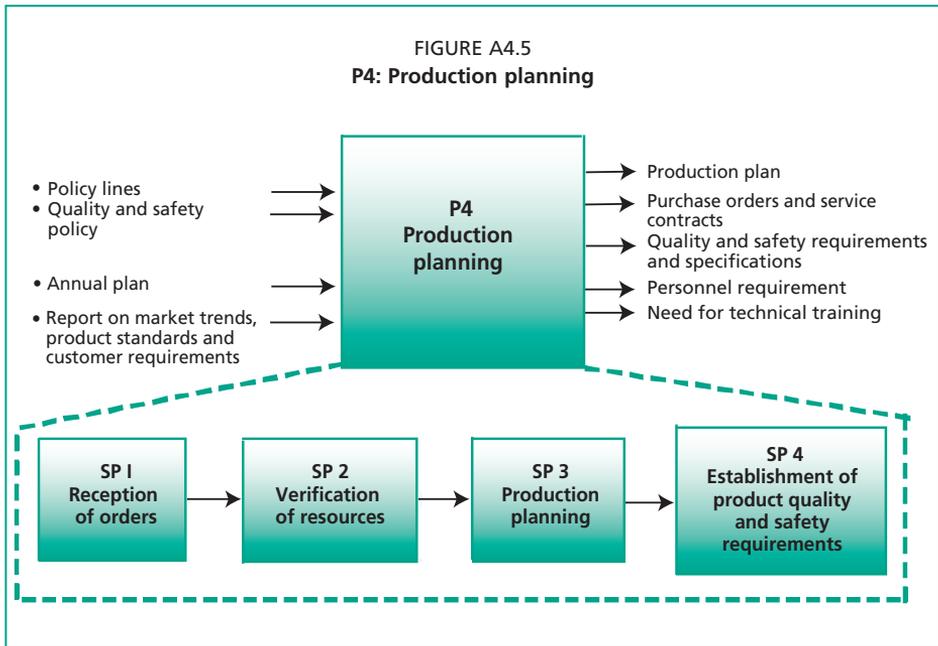
P8: Maintenance and calibration

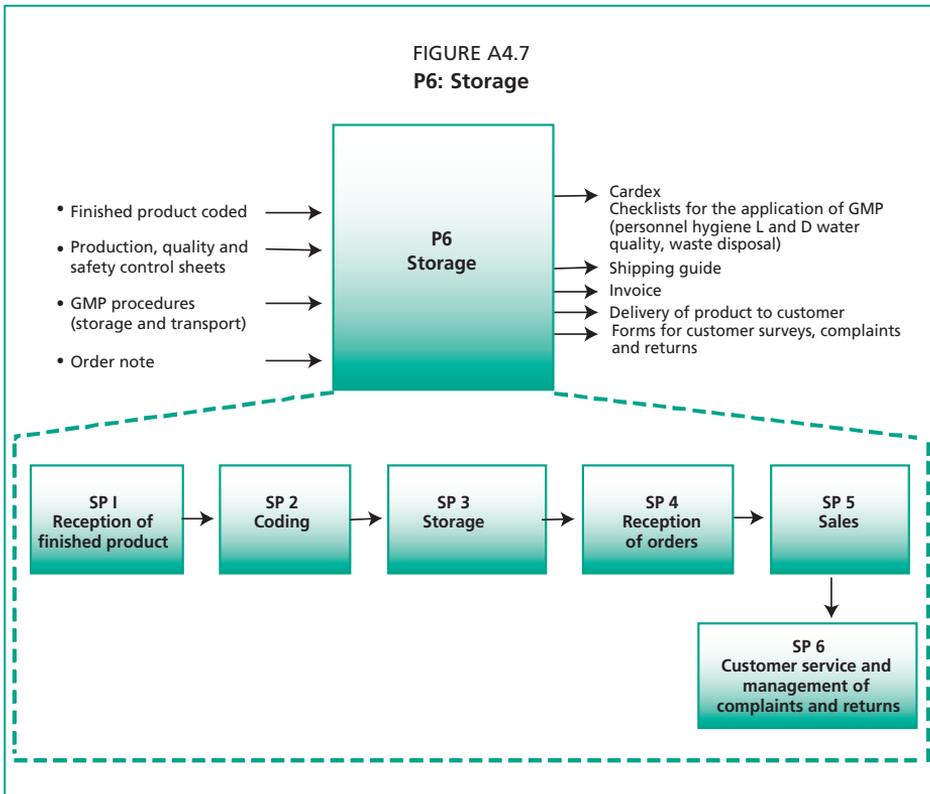
P9: Purchasing and procurement



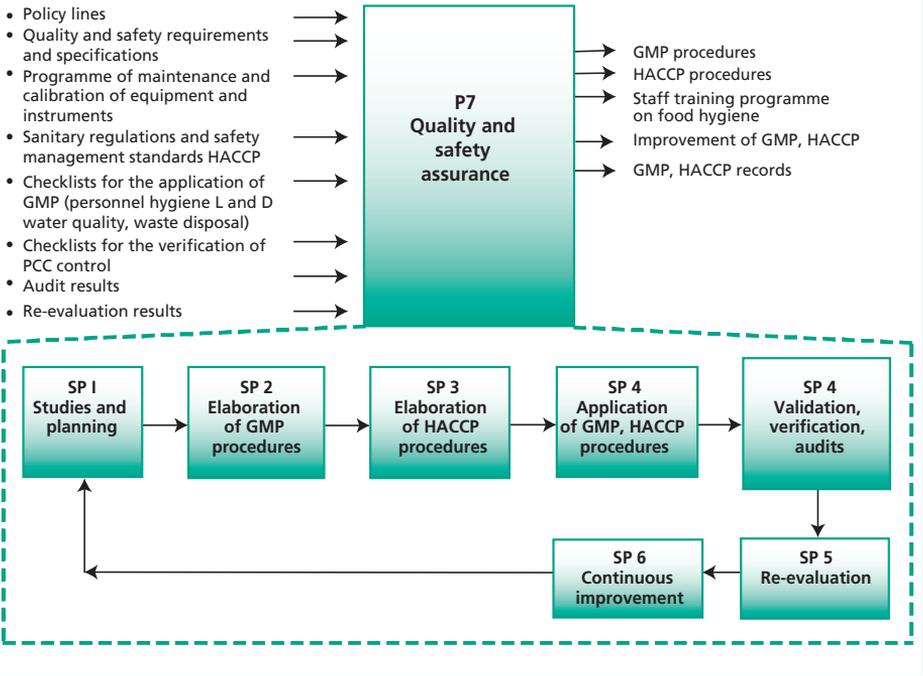


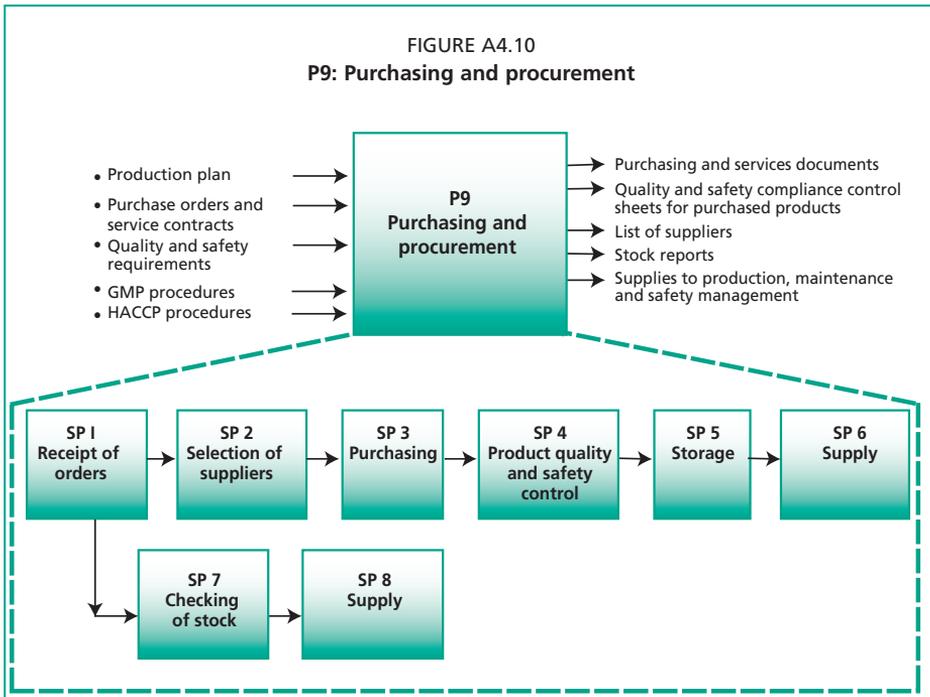
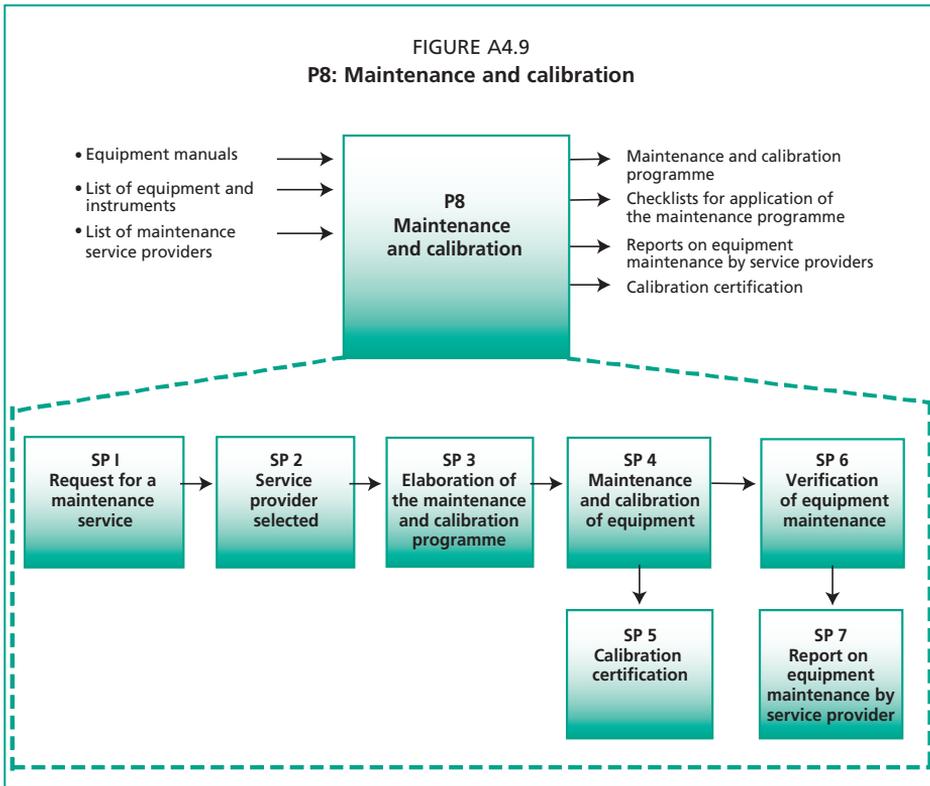




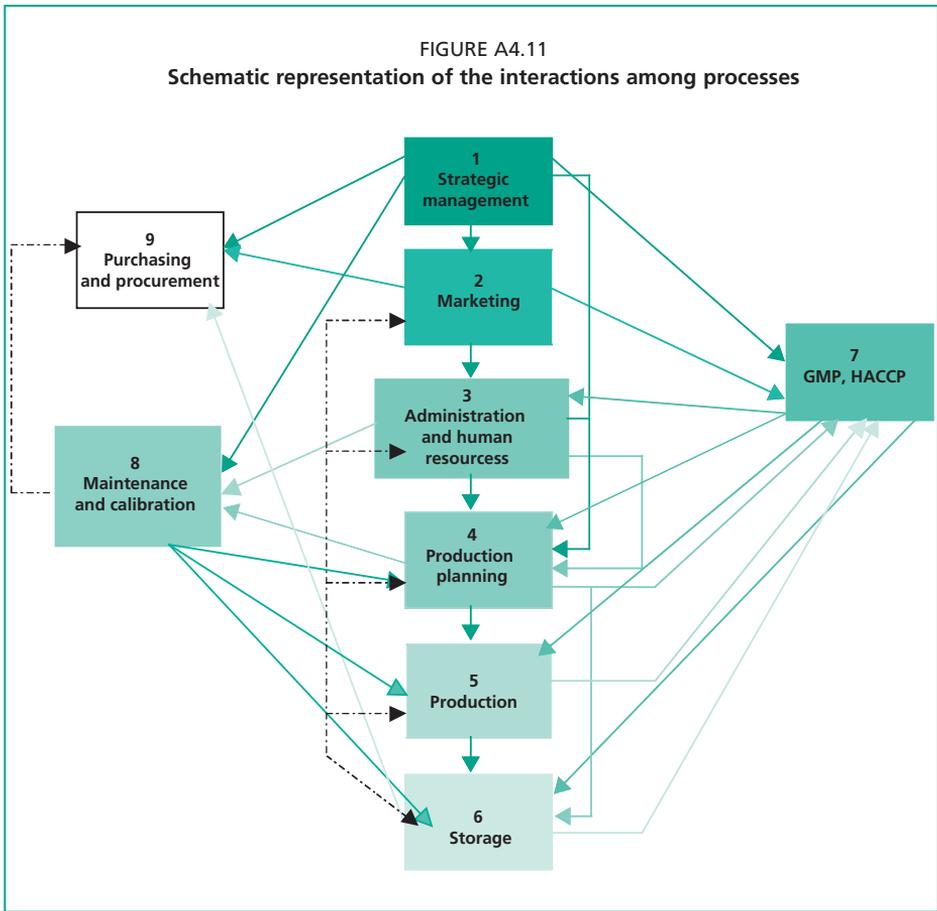


**FIGURE A4.8
P7: Quality and safety assurance**





**MODULE
3**



Appendix 5

Examples of process cards and interaction between processes

EXAMPLE 1: PROCESS CARD

Process – Management of processes	
Objective of the process	<ul style="list-style-type: none"> • Establish guidelines for management and development of the business based on the customer's needs and compliance with local regulations and with efficiency and quality • Establish strategies that assist in achieving the objectives outlined in the company's mission and vision
Indicators	<ul style="list-style-type: none"> • Percentage of personnel who are aware of the company's policies • Percentage of fulfilment of the annual business plan
Scope	<ul style="list-style-type: none"> • Applies throughout the company
Documents and records	<ul style="list-style-type: none"> • Company policy documents • Annual business plan
Person in charge	<ul style="list-style-type: none"> • General manager
Resources	<ul style="list-style-type: none"> • Personnel • Office materials
Inspections	<ul style="list-style-type: none"> • Once a year the degree of fulfilment of the annual plan will be reviewed by means of an internal audit • Staff awareness of company policies is reviewed annually through staff surveys
Control variables	<ul style="list-style-type: none"> • Policy is disseminated and understood by staff • Application of annual plan. Identifies where it is possible to 'act' in order to control the process
Failure conditions	<ul style="list-style-type: none"> • High percentage of production is not accomplished • Products do not meet specifications
Interaction with other processes	<ul style="list-style-type: none"> • These are presented in Table A5.1.

TABLE A5.1

Interaction with other processes

Process (P) supplier	Input	Subprocess (SP)	Output	Client of the process
P2 Marketing	Report on market trends, regulations, standards and customer requirements	SP1 Establishment of policies	Policy lines Quality and safety policies	P2 Marketing P4 Production planning P9 Purchasing and procurement P7 GMP–HACCP P3 Administration and human resources
P2 Marketing	Report on the results of applying the marketing plan	SP2 Preparation of the annual plan	Annual plan	P2 Marketing P4 Production planning P8 Maintenance and calibration P3 Administration and human resources
P6 Storage	Report on sales, complaints and returns			

EXAMPLE 2 – PROCESS CARD

Process 7: Quality assurance (GMP–HACCP)	
Objective of the process	<ul style="list-style-type: none"> • To guarantee the safety of products through compliance with regulations in the target markets and the implementation of HACCP systems
Indicators	<ul style="list-style-type: none"> • Percentage of procedures that are not applied or are inadequately applied • Percentage of corrective measures that are applied • Number of issues identified in an audit • Percentage of deviations found during monitoring
Scope	<ul style="list-style-type: none"> • All the processes of production, planning, purchasing and procurement, preparation of raw material and inputs, finishing of products and sales management
Documents and records	<ul style="list-style-type: none"> • Safety policy • GMP procedures (records of activities carried out) • Standardized operational procedures (and records of the application of the procedures) • HACCP plan • Staff training programme on food hygiene (records) • Improvement in safety management • Records of control and monitoring activities carried out
Person in charge	<ul style="list-style-type: none"> • Head of quality control and the HACCP team
Inspections	<ul style="list-style-type: none"> • Compliance with the annual plan is reviewed twice a year, through an internal audit and validation of the HACCP plan
Control variables	<ul style="list-style-type: none"> • Application of GMP programmes (control measures) • Critical control points (in HACCP) and application of corrective measures • Issues identified in an audit
Failure conditions	<ul style="list-style-type: none"> • Presence of contaminants in products • GMP and HACCP procedures are not applied or are applied inadequately • Non-conformance in an audit
Interaction with other processes	<ul style="list-style-type: none"> • These are presented in Table A5.2.

TABLE A5.2

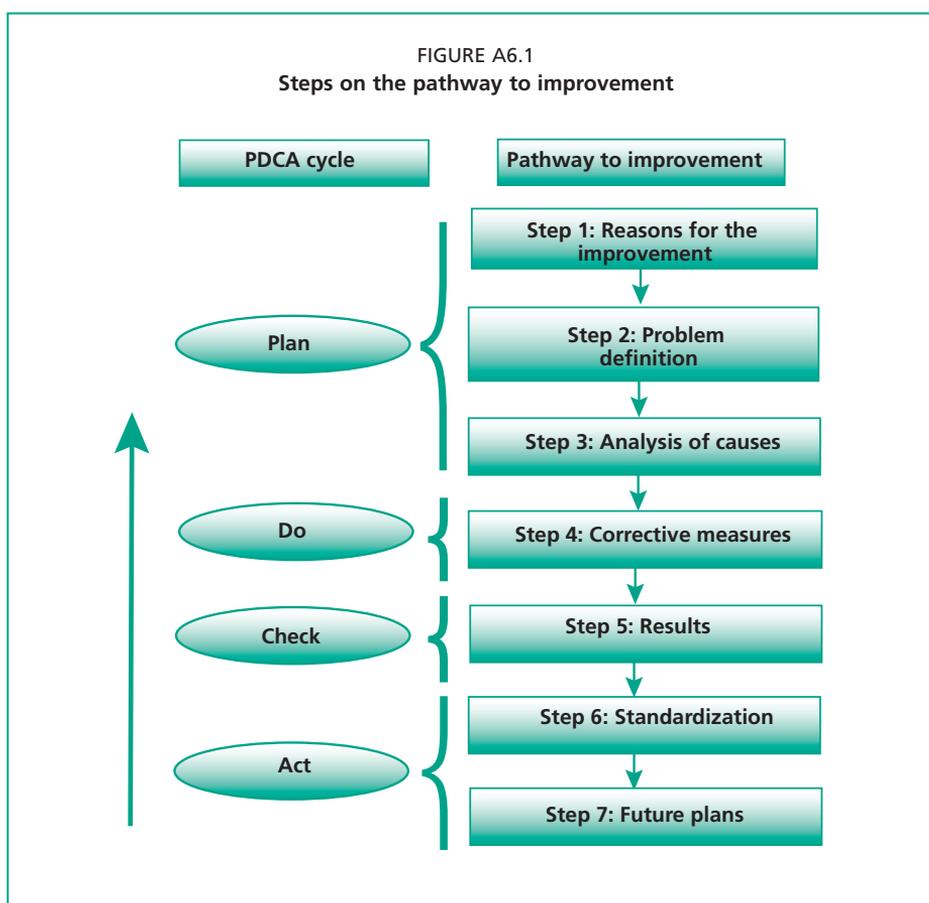
Interaction with other processes

Process (P) supplier	Input	Subprocess (SP)	Outputs	Client of the process
P1 Strategic management	Policy lines	SP1 Study	HACCP Plan	P4 Production planning
P2 Marketing	Market information	SP2 Preparation of GMP procedures	GMP Procedures	P9 Purchasing and procurement
External	Sanitary regulations and safety management standards HACCP	SP3 Preparation of the HACCP plan	Training programme in food hygiene	P5 Production
P4 Production planning	Production plan			P6 Storage
P8 Maintenance and calibration	Maintenance and calibration programme			P8 Maintenance and calibration
P3 Administration and human resources	Payroll and staff profile			P3 Administration and human resources
P9 Purchasing and procurement	Purchasing and procurement of materials	SP4 Application of GMP and HACCP	Application of GMP and HACCP	P4 Production planning
				P5 Production
				P6 Storage
				P8 Maintenance and calibration
P5 Production	Checklists for the application of GMP (staff hygiene, control of water quality, waste disposal) Checklist for critical control points and corrective measures	SP6 Continual improvement of the system	Continual improvement of the system (begins with new HACCP study)	P4 Production planning
				P9 Purchasing and procurement
				P5 Production
				P7 GMP-HACCP
				P3 Administration and human resources
SP4 Validation, monitoring and auditing	Audit results Re-assessment results			P8 Maintenance and calibration

Appendix 6

The pathway to improvement⁴

This is a technique for solving problems by following a structured sequence of seven steps. When this technique is applied systematically it becomes a process of continual improvement. Figure A6.1 illustrates these seven steps on the pathway to improvement.



⁴ The methodology for an improvement project has been developed with reference to the following documents:

- *Manual Gestión de la Calidad para Servicios de Sangre* of the Pan American Health Organization –
- *Materiales of the Course Mejora Continua de la Gestión* organized by SENATI, Lima, Peru, 2005.
- *Handbook of quality tools: the Japanese approach*, 1990.

STEP 1: IDENTIFICATION OF THE ELEMENTS TO BE IMPROVED

Any improvement project begins with the impetus or leadership of the company's management, i.e. with the commitment to improve the company's policies and objectives. This commitment implies provision of the resources necessary to implement continual improvement processes.

As the analysis in Theme 3 of this module shows, the process approach generates information on processes and specific activities where a company could make improvements. Some company activities for defining priority items for improvement are:

- analysis of measurement data;
- review of audit results;
- review of indicators;
- analysis of surveys and customer needs;
- opinions of employees in the different departments;
- assessment of the company's performance over a specific period;
- information on the fulfilment of objectives and goals, the behaviour of company components, review of complaints from both internal and external customers, etc.;
- application of corrective and preventive measures; where and why they were applied.

When this information is analysed, the gap between the actual and desired situations can be determined. There is a range of management tools for determining which priority topics should be analysed; some examples are given in Appendix 8.

STEP 2: PROBLEM DEFINITION

In any given process – whether operational, support, strategic or management – it is possible to identify a number of problems that need to be addressed, as well as opportunities. It is important for entrepreneurs and their working groups to analyse defined objectives in order to identify those that would do most to reduce the gap between the actual situation and the desired situation. The Pareto diagram in Appendix 8 illustrates a useful tool for analysing identified problems.

STEP 3: ANALYSIS OF CAUSES

This step consists of identifying and analysing the causes of the problems requiring improvement. A technique used for analysing the causes of problems and identifying solutions is a **cause and effect diagram**. An example of this technique is given in Appendix 7.

STEP 4: CORRECTIVE MEASURES AND PREPARATION OF AN ACTION PLAN

Once the fundamental causes of the problem have been identified, measures or solutions are determined and an action plan is drawn up to implement these measures. It is essential to carry out a feasibility analysis, not only from a technical standpoint, but also to determine the economic and administrative feasibility

of implementing the proposed measures. Appendix 7 shows how a matrix of corrective actions can serve as useful tool for defining actions (Table A6.1).

An action plan is an ordered list of everything that must be done to ensure that corrective measures are applied. The plan should answer the following questions:

- **What is to be done?** Description of the corrective measures.
- **Who is in charge of implementing them?** Identifies the person responsible for applying the corrective measures.
- **When?** The deadline or the duration of the period of action.
- **How is it to be done?** Description of methods and procedures.
- **Where are the measures to be applied?** The place where the corrective measures will be applied.
- **For what reason?** What will be achieved by the corrective measures?
- **How will you determine whether or not the measures are being applied correctly?**

STEP 5: REVIEW OF THE RESULTS

This step consists of checking to what extent the implemented measures have resolved the problem. Problem indicators are compared before and after applying the measures. Bar graphs help to visualize the ‘before’ and ‘after’ situations and show the degree of improvement. Figure A6.2 depicts different types of graph that can be used.

STEP 6: STANDARDIZATION

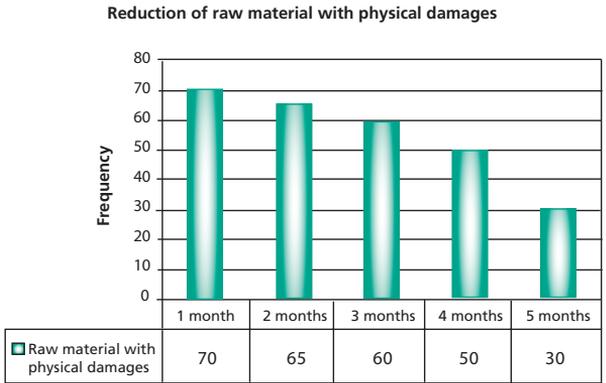
If the results show improvements as a result of following the pathway, the next step is to incorporate the measures into the company’s working procedures to ensure that they are applied permanently. Employees are trained to apply the procedures and monitoring systems are established to check that the measures are applied correctly.

STEP 7: FUTURE PLANS

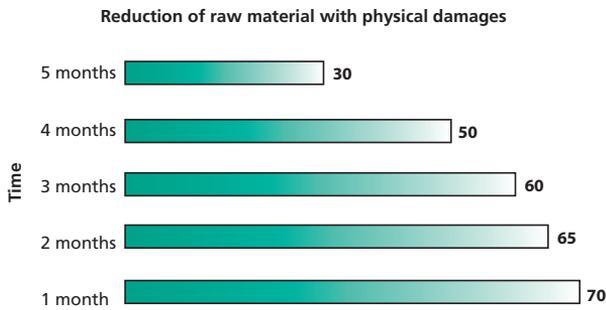
In this final step, the working group analyses the results of the improvement process by answering the following questions:

- What was done well?
- What can be improved or corrected?
- What should be done differently?
- Which lessons have been learned?

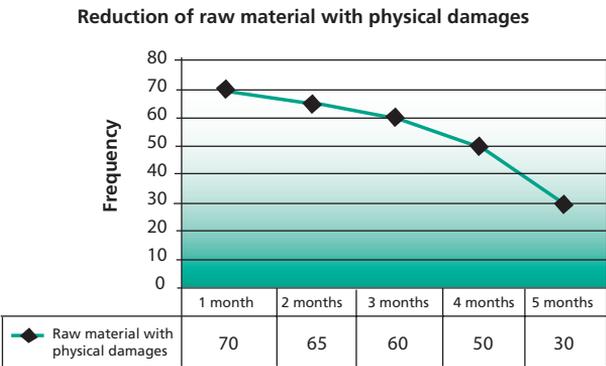
FIGURE A6.2
Examples of visual formats for presenting results



Vertical bars



Frequency horizontal bars



Line graph

Appendix 7

Methodologies for determining the causes of a problem and establishing corrective measures

METHODOLOGIES FOR DETERMINING THE CAUSES OF A PROBLEM: THE CAUSE-EFFECT DIAGRAM

Whenever a problem exists and there are differing ideas or opinions on its possible causes, it is always useful to apply the cause-effect diagram technique.

HOW IS A CAUSE-EFFECT DIAGRAM DRAWN UP?

The **effects** relate to specific quality characteristics or to process problems (e.g. losses of quality, safety problems, etc.). The **causes** are the factors that influence or determine the **effects** that have been identified. These include: inappropriate methods, environment, poor quality materials, poorly maintained machinery and equipment, incorrect measurements, unsatisfactory staff behaviour, etc. The ‘spines’ of the diagram are arrows that indicate the relationship between the effect and the causes. The steps to be followed in drawing the diagram are as follows.

Step 1: Identify the primary causes and write them at the end of the ‘main spines’ which connect to the ‘central spine’

A practical approach is to consider the six ‘Ms’: manpower, materials, machinery, method, medium (environment) and measurement (control). Each team can use these particular criteria or devise their own, according to the situation. Figure A7.1 shows a general cause-effect diagram.

Step 2: Identify the main causes of the effect

The factors contributing to the main causes are identified. These are denoted as secondary causes, not for their lesser importance but because of their place in the sequence. If necessary, third-level causes may be identified, as well as successive levels. This process is very important as the diagram’s effectiveness depends on it. It is important to encourage discussion and several rounds of questioning in the group until the root cause is identified (Figure A7.2).

Figure A7.3 shows the main and secondary spines for identifying the probable causes affecting the control of the reception of raw materials.

FIGURE A7.1
General cause-effect diagram

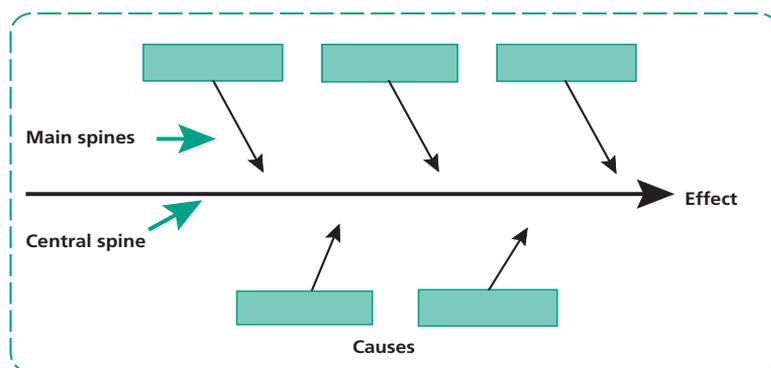
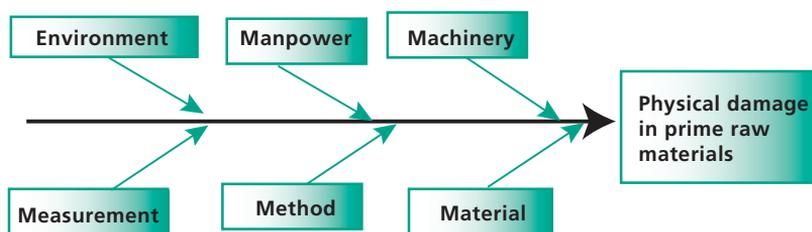


FIGURE A7.2
Identification of the main causes in a cause-effect diagram

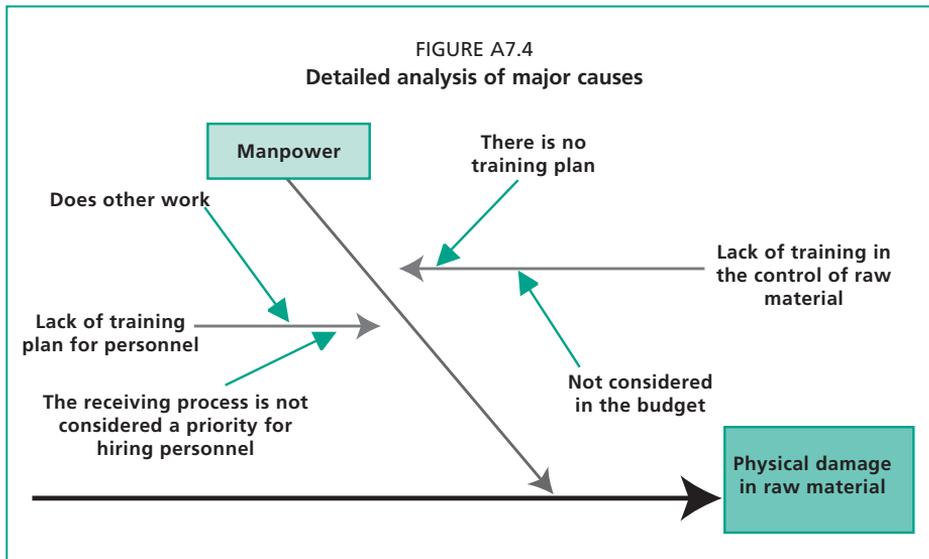
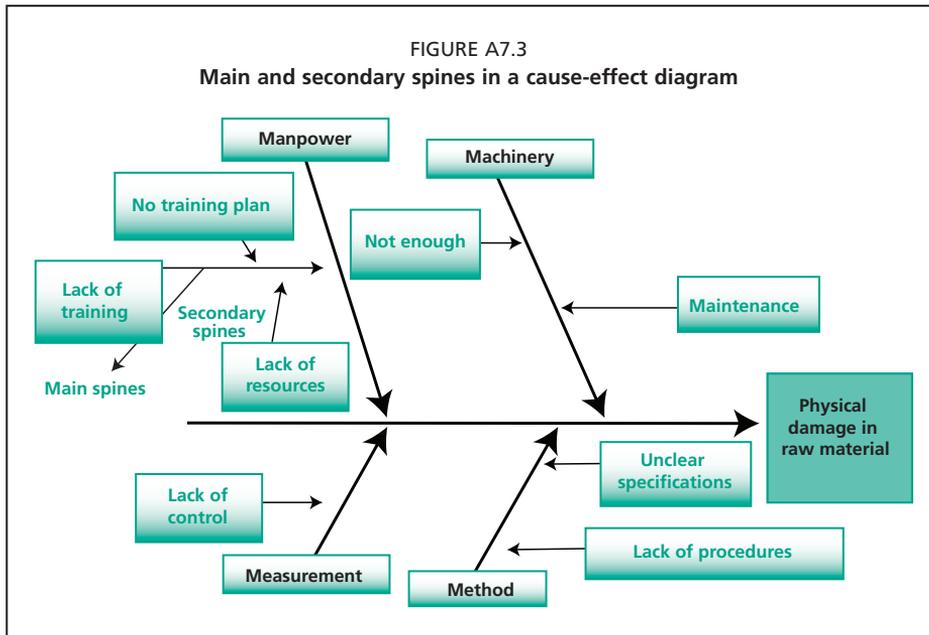


Step 3: Check that no factors have been omitted

When the diagram is complete, working team members must check that they have not forgotten any significant factors and, if so, these factors must be included in the diagram.

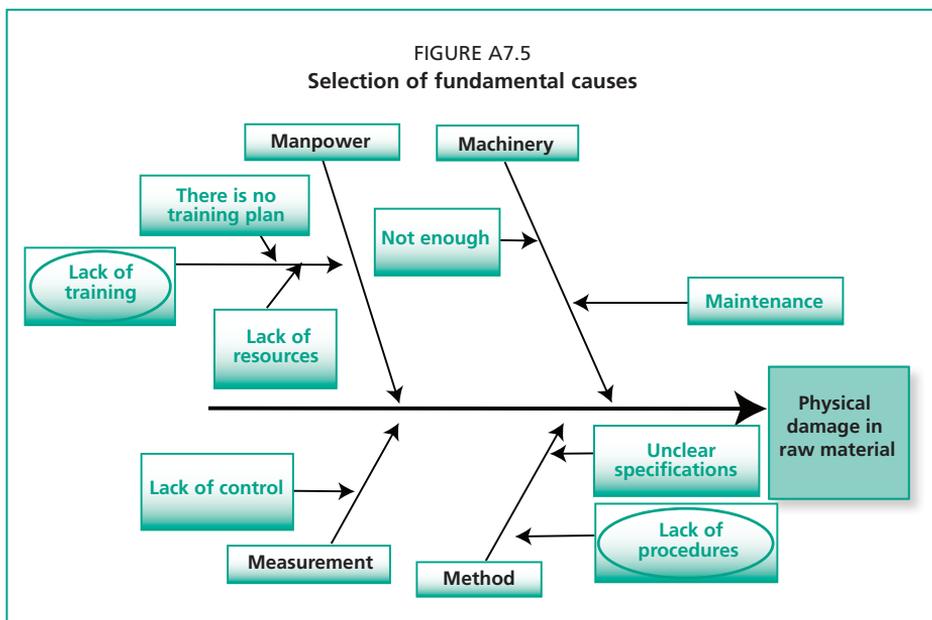
Step 4: Choose the main causes likely to have the greatest impact

This means that a level of importance is attributed to each factor and a circle is drawn around each factor. These are the factors that have the greatest impact on the problem. The next step is to use data to check these main causes. It is not sufficient to check that the main cause exists where the problem exists, it is also necessary to check that the main cause does not exist where the problem does not exist. (Figure A7.4).



Step 5: Important information is noted

Data referring to the product and the process being analysed should include the names of people who worked on the analysis; this data must be written down. Additional data could be included on the product, process and date. The example in Figure A7.5 shows that the fundamental causes are a lack of training and lack of procedures.



METHODOLOGIES FOR IDENTIFYING CORRECTIVE MEASURES

After identifying the main causes of the problem, the corrective measures for resolving the problem are selected. The following example shows a useful procedure that can be used to support this process.

Corrective measures matrix

This takes the form of a tree showing the relationship between the problem, its main causes and corrective measures. It is constructed as follows:

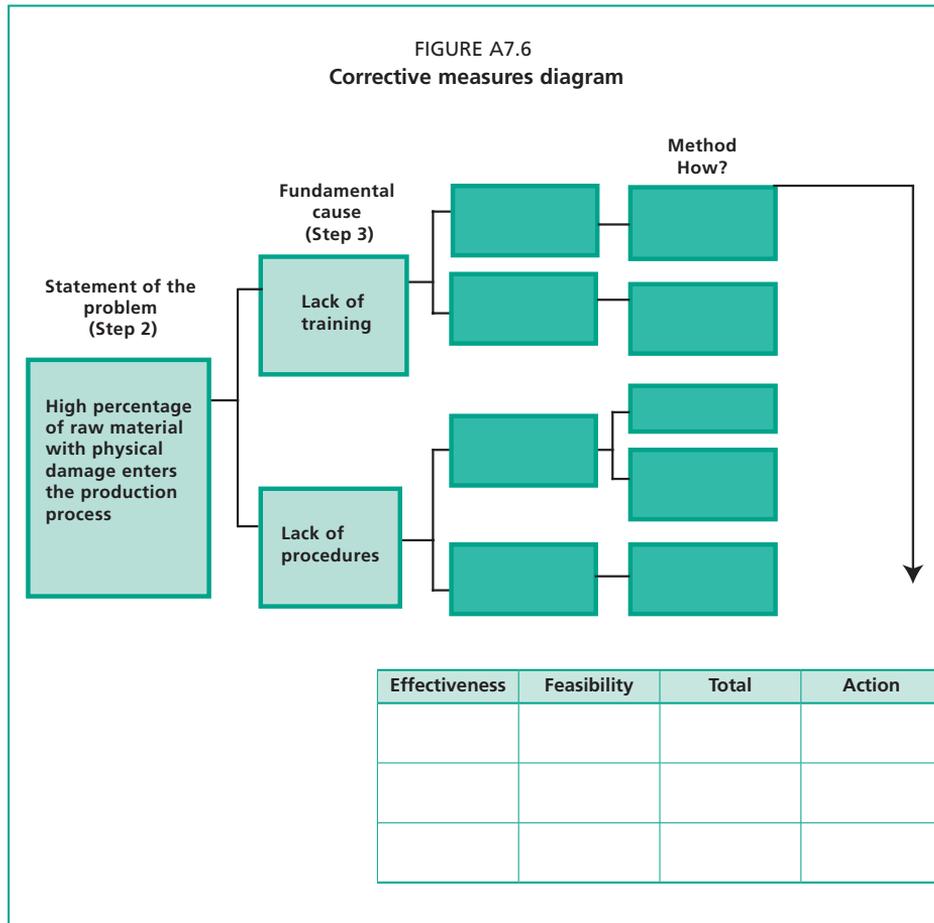
- Step 1:** Write the problem statement in the box marked 'problem'.
- Step 2:** Place in the 'causes' boxes the causes that have been identified and checked in the cause-analysis stage (one or more).
- Step 3:** Identify the corrective measures for each main cause. Brainstorming or multivoting methods to reduce the number of topics are generally recommended for identifying corrective measures and methods.
- Step 4:** Identify the most suitable method by attributing to each method a score of 1–5 for its effectiveness and feasibility.

Effectiveness is the measure's ability to reduce the main cause. *Feasibility* is the potential for carrying out the corrective measure effectively. The scoring scale is as follows:

1 = none; 2 = little; 3 = moderate; 4 = significant; 5 = excellent

Step 5: Lastly, multiply the scores for effectiveness and feasibility and then classify the corrective measures according to the total score

A number of corrective measures can be implemented, depending on available resources and the improvement objectives. In the box marked ‘Action’, indicate whether or not the action will be carried out (Figure A7.6).



Appendix 8

Methodologies for identifying and prioritizing problems for improvement

This section presents different methodologies and examples for the identification of problems for improvement, as well as methodologies for analysing identified problems.

METHODOLOGIES FOR THE IDENTIFICATION OF PROBLEMS FOR IMPROVEMENT

- brainstorming
- multivoting
- matrix for prioritizing areas for improvement (selection of areas)

Brainstorming

This is a dynamic and participatory methodology (involving all the members of the working team) that promotes the generation of ideas (in this case on areas for improvement). It comprises the following three steps.

Generation of ideas

In this step, the working team explains the brainstorming objective and scope. Team members are given 5–10 minutes to write down their ideas. At this stage it is the number of ideas that is important rather than the quality (this is achieved later). After this 5–10 minute period (during which the ideas are neither examined nor discussed), each member presents one idea in each round of presentations. If any of the participants has no further ideas when their turn comes around, the next participant continues.

Clarification

Each group member explains their idea and the rest of the team comment and express their opinion of it.

Assessment

Where ideas are similar, they are grouped together, while duplicated ideas are eliminated.

Example: the operational processes working group of a small fruit processing industry presented the following ideas for improvement

- Improve relations with suppliers.
- Reduce the waiting time for raw materials.
- Improve control of raw materials at reception.
- Hygiene training for staff.
- Increase stocks of packaging, bottles and jars.
- Programme daily talks on hygiene for the personnel.
- Improve interpersonal relations and the work atmosphere.
- Prepare work instructions.
- Improve sanitation in the processing area.
- Improve the distribution of work areas.
- Increase the number of the finest sieves in the pulper.

Multivoting

A group of topics can be chosen by means of a series of successive votes.

First vote

Each member of the team votes for the topics they prefer, allocating only one vote to each topic. The topics receiving total votes equal to or greater than half the number of participants are entered in the second round of voting.

Second vote

Each member is now given votes equivalent to half the number of topics on the new list. As in the previous round, each participant is allowed only one vote on each topic.

Matrix for the selection of topics

After brainstorming and multivoting, the following topics were prioritized:

- Improve relations with suppliers.
- Improve control of raw materials at reception.
- Hygiene training for staff.
- Increase stocks of packaging, bottles and jars.

Successive voting

The second round is repeated until only 3–5 topics remain. Each team member scores the topics selected by multivoting in accordance with two factors: their

potential impact on the customer (Y) and the need for improvement (X). The scale for scoring both factors could be: 1 = none; 2 = little; 3 = moderate; 4 = significant; 5 = excellent. The final score is obtained by multiplying factors X and Y. In addition:

- participants score secretly so that they are not influenced by the others;
- the score for each topic is the average of all its scores;
- the topic receiving the highest score is chosen because the members of the team have selected this topic as having the greatest impact on the customer and the greatest need for improvement (or whatever the identified objective is).

Continuing with the example, one participant scored the topics as follows.

Matrix for the selection of topics			
Topics	Impact on the customer (X)	Need for improvement (Y)	Total (X × Y)
Improve relations with suppliers	3	4	12
Improve control of raw materials at reception	5	5	25
Hygiene training for staff	4	4	16
Increase stocks of packaging, bottles and jars	5	4	20

In this case, the participant awarded the highest score to the topic “improve control of raw materials at reception”.

Methodologies for analysing identified problems

After selecting the topics, the next step is to perform a more in-depth analysis on the basis of their impact on the defined objectives. One technique that facilitates this analysis is the Pareto diagram.

The Pareto diagram

This is a bar graph depicting the order of comparison of factors relating to a problem. This comparison makes it possible to identify a few key factors that contribute significantly to the problem, in order to separate them from many other factors that contribute very little to the problem. This graph is useful as it identifies key factors requiring attention at a glance, and therefore enables the necessary resources to be focused on corrective actions without wasting effort.

Characteristics

The Pareto diagram is used to identify key elements of a particular problem.

- It shows the level of defective products, repairs, production process defects, complaints, errors or accidents.
- Good analysis and its interpretation depend largely on prior analysis of causes and the data collected.

STEPS IN DRAWING UP A PARETO DIAGRAM

Step 1: Analysis of the data that led to identification of the problem

For the topic chosen by multivoting (“improve control of raw materials at reception”), it is desirable to identify all the problems involved in this topic and to select the problem with the greatest impact. The problems that occur most frequently are identified by analysing the data.

Example: in this case, data on different production lots were collected over a six-month period and the following problems were identified according to their frequency.

Problem	Details of the problem	Frequency
A	Raw materials (fruit and vegetables) with mechanical damage and cuts	78
B	Underweight	9
C	Raw materials fail to meet technical specifications (Brix and acidity)	63
D	Unsuitable varieties	7
E	Unsuitable maturity level	5
F	Contaminated and dirty raw materials	11
G	Received more than required	3
H	Raw materials with insect damage	10
I	Other	4
	Total	190

Step 2: Data are tabulated and cumulative numbers are calculated

The problems should be organized in descending order, from the highest frequency to the lowest. Cumulative numbers are calculated starting with the highest level, which is increased by the number in the level below for each row, as shown in the next example. The data in the above table show that the problem that has the greatest frequency is raw materials with mechanical damage, followed by raw materials that fail to meet technical specifications.

Step 3: A graph is drawn on the X and Y axes

The problems are displayed in descending order from left to right on the horizontal axis.

Step 4: The data are displayed as a bar graph

The data are presented in descending order on the horizontal axis, as shown in Figure A8.1.

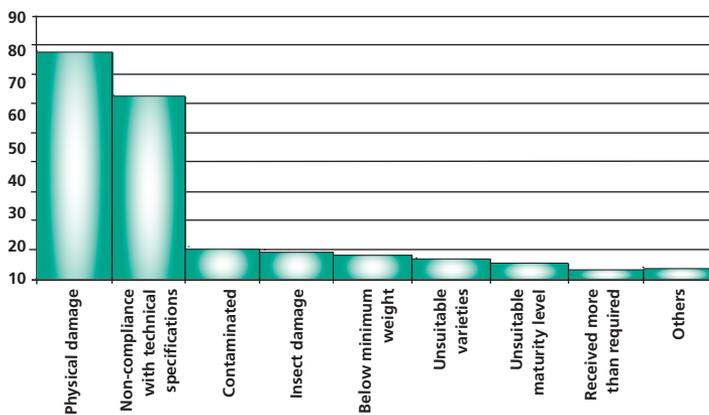
Step 5: A graph showing the curve of the cumulative data is drawn

The curve begins over the bar representing the topic with greatest frequency (Figure A8.2).

Example

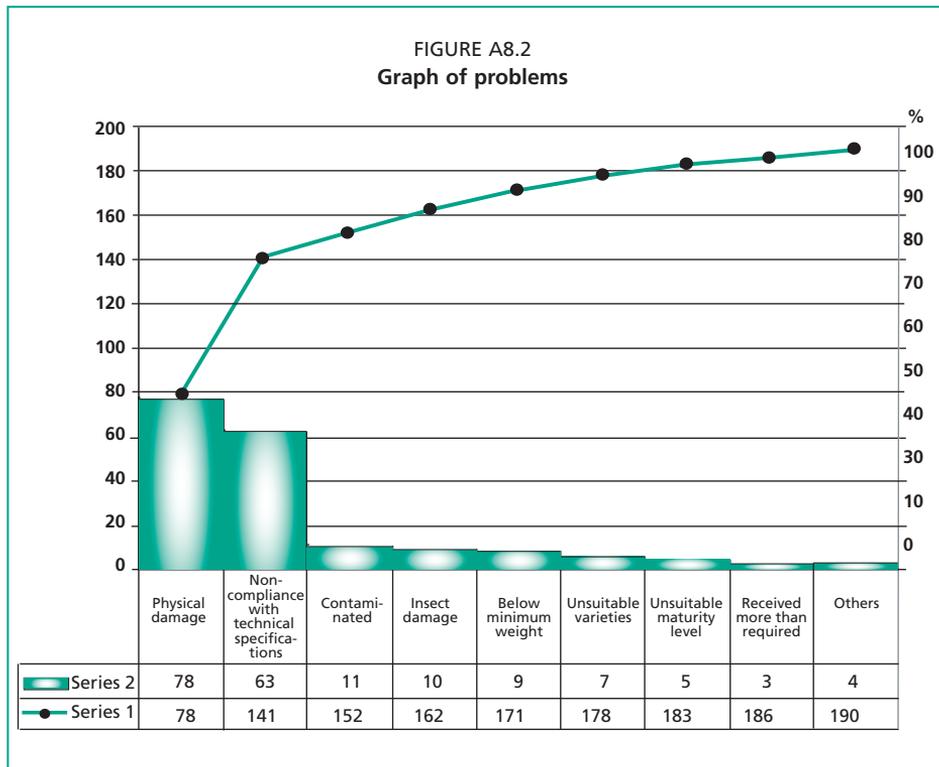
Problem	Details of the problem	Frequency	Cumulative
A	Raw material (fruits and vegetables) with mechanical damage and cuts	78	(+) 78
C	Raw materials fail to meet technical specifications (Brix and acidity)	63 (+)	141
F	Contaminated and dirty raw materials	11	152
H	Raw materials with insect damage	10	162
B	Underweight	9	171
D	Unsuitable varieties	7	178
E	Unsuitable maturity level	5	183
G	Received more than required	3	186
I	Others	4	190
	Total	190	

FIGURE A8.1
Bar graph in descending order



Step 6: A vertical line is drawn to visualize the percentage scale

A vertical line is drawn on the right side of the graph as a percentage scale for each category. Figure A8.2 and Table A8.1 show that two of the problems (22 percent of the nine problems listed) cause 74 percent of the problems relating to unsatisfactory control during the reception of raw materials. According to the Pareto principle, the highest proportion of problems relates to only two problems, meaning that, if their causes are eliminated, most of the problems will disappear.



Step 7: Problem statement

In the above example, the problems that occur with the greatest frequency are:

- raw materials have physical damage;
- raw materials fail to meet technical specifications.

The working group should choose one of these two problems, taking into account customer requirements relating to the problem identified.

TABLE A8.1

Analysis of the problems

Problem	Details of the problem	Frequency	Percentage
A	Physical damage	78	41.05
C	Raw materials fail to comply with technical specifications (Brix and acidity)	63	33.16
F	Contaminated and dirty raw materials	11	5.79
H	Raw materials with insect damage	10	5.26
B	Underweight	9	4.74
D	Unsuitable varieties	7	3.68
E	Unsuitable maturity level	5	2.63
G	Received more than required	3	1.58
I	Other	4	2.11
	Total	190	100.00

Next, an improvement objective and a problem statement must be draw up. For example:

- The improvement objective is: “To reduce by 50 percent the defects resulting from physical damage of raw material that enters the plant for processing.”
- The problem statement is: “A high percentage of raw material with physical damage enters the processing stage from raw materials reception.”

Appendix 9

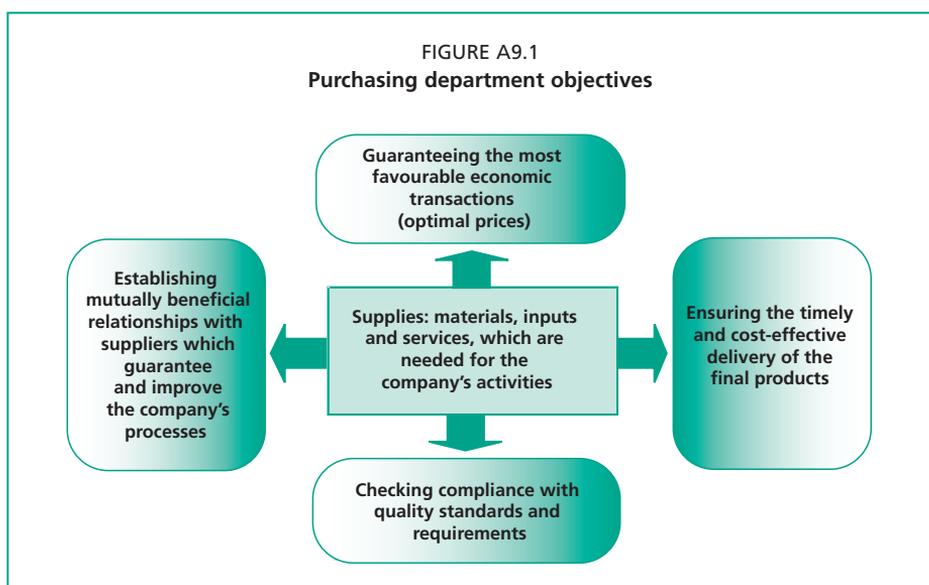
The purchasing department in an agro-industrial enterprise

Like every other type of company, agro-industrial enterprises have organized and synchronized areas or departments responsible for managing productive resources (labour, capital and natural resources) in order to produce goods and services that can be sold in the marketplace.

One of these areas is purchasing, the influence of which extends to the whole organization. The purchasing department maintains a close relationship with all other functional areas (Figure A9.1). Deficiencies in purchasing management can have a serious affect on the quality of the final product, production efficiency and the company's financial. Any action aimed at improving purchasing must therefore take into account the demands made on the other areas of the company.

IMPORTANCE OF THE PURCHASING DEPARTMENT

The purchasing department is one of the main sources of cost in an industrial company. It has a direct impact on the quality of the final product and the effectiveness of production flow. Purchasing problems can also generate inefficiencies, such as failure to meet deadlines and excessive hidden costs.



MANAGEMENT OF PURCHASING ACTIVITIES

A company that decides to purchase materials must manage a number of purchasing activities. Purchasing management takes into account several factors, including inventory and transport costs, the availability of supplies, the efficiency of delivery and the quality of supplies.

Basic purchasing tasks include: (i) selecting suppliers and establishing close relationships with them (strategic alliances); (ii) preparing and adapting specifications for materials ordered; (iii) timely ordering; (iv) preparation of contracts and purchase orders to avoid possible legal problems; (v) checking the reception of materials; (vi) resolving differences with suppliers and (vii) checking that invoices are paid. Pay attention to any problem, no matter how small, and find an immediate solution in order to avoid any possible delay or error in production that might threaten the company's stability. Purchasing management has many functions, which may be grouped under:

- i. general functions;
- ii. management functions;
- iii. administrative functions.

General functions	
Manage the purchase of materials, components, equipment and installations, subcontracting of product services, etc. to ensure that what is required is made available at the right time and at the optimal price, while complying with established specifications.	
<p>Management functions</p> <p>Plan purchases Establish objectives and strategies. Negotiate purchasing conditions.</p> <p>Organize purchases Organizational and functional structure</p> <p>Control main variables Price, level of service, loyalty, stock levels, indirect costs, transport</p> <p>Improve purchases</p>	<p>Administrative functions</p> <p>Selection and approval of suppliers Requesting bids from suppliers Analysis of bids Selection of suppliers Negotiation of purchasing conditions Placing of orders Monitoring of orders Management of material shipments Reception of materials Control of suppliers' invoices Evaluation of suppliers</p>

DESCRIPTION OF THE PURCHASING PROCESS

Need for purchasing

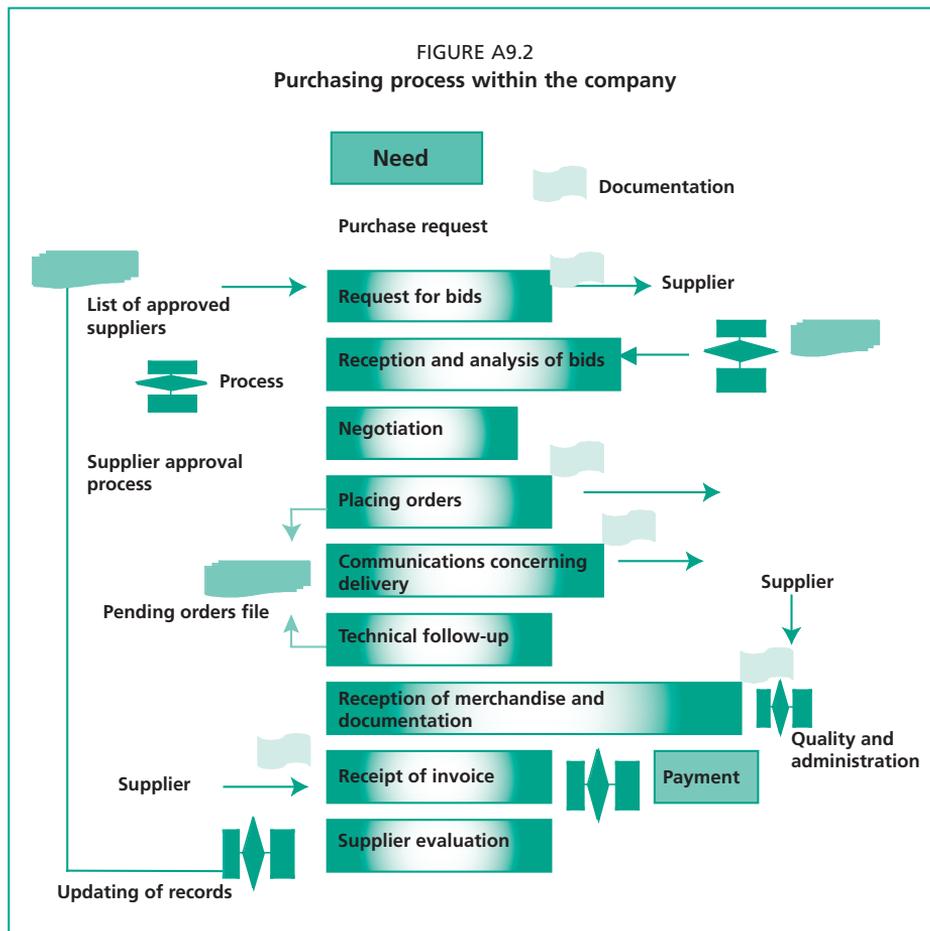
As the purpose of purchasing is to supply materials and services to the entire company, it must be coordinated closely with the areas of management, production, sales, accounting and storage.

Purchase request

The purchasing process begins with a requisition (Figure A9.2). Once this is received by the purchasing department, it is reviewed to make sure that the following are clearly defined:

- date of acquisition;
- department of origin;
- name of requester;
- article requested;
- quantity;
- delivery date;
- any observations, plus the requester’s signature.

The purchase requisition is then reviewed to check that it has been correctly authorized in accordance with company policy. If necessary, any relevant copies of plans or quality specifications should be attached to the requisition.



Source: Adapted from TECNUM (no date).

Attached information

The information to be attached to the requisition should, if necessary, include:

- technical documentation showing the characteristics of the product to be purchased;
- plans;
- quality specifications;
- the recommended supplier.

SUPPLIER SEARCH AND ANALYSIS

The next step in the process is for the buyer to seek sources of supply for the requested materials in order to analyse prices and then decide on the purchase. The buyer may consider one of the following search options:

- search from the database of suppliers/products;
- search from the approved list of suppliers;
- search for new suppliers.

When examining a particular supplier, consideration should be given to whether the products or the raw materials offered will have a positive impact on the company's productivity, quality and competitiveness. Consequently, supplier selection is the most important decision taken by the purchasing department. For supplier analysis and selection, as well as for any subsequent negotiations, buyers must have experience of the markets for the raw materials being purchased. They should be able to interpret quantitatively any changes in markets because such changes will be of great interest and could affect the company directly. Finally, they should keep statistics and record important data on market behaviour relating to each material, as this is an important factor in purchasing decisions.

Call for bids (tendering)

Specifications for the call for tender should include:

- delivery quantity, deadline, place and person in charge;
- certification, documentation, guarantees, form of payment, materials to be used, type of packaging, type of pallet;
- tests to be carried out, approval, security requirements, etc.

Negotiation

After receiving the bids, the next step is negotiation. For this step, both parties must work together in good faith because the company needs to purchase quickly and the supplier needs to sell. Negotiations cover price, delivery, form of payment, stocks, etc.

Placing the order

Once the bid has been accepted, the next step is to place the order using a document that specifies the following: article, total quantity, price, form of payment, place of delivery, address to send invoices, lots to be delivered, essential documentation, testing, date of audit, type of packaging and any other relevant details.

Monitoring the order

The order may be monitored by means of documentation on:

- order flow details;
- lists of orders pending;
- identification of late orders;
- reminders to suppliers.

Reception of the order

Once the buyer and the seller have reached an agreement and have signed a contract, or an order has been placed, the supplier should ship the merchandise using the most appropriate means of transport, or whatever means has already been agreed. The merchandise is accompanied by a document called a shipping note. Other documents include:

- certificate of quality, certificate of materials;
- operating or instruction manuals;
- guarantees.

Supplier					
Representative:			Customer details:		
Ports:					
N° of loads:					
Shipping mode:					
Point of delivery:					
Date: _____ Shipping note number: _____ Order number: _____					
Code	Quantity	Description	Price	Department	Cost
Name and Signature:			Observations:	Accompanying documents	
Received by:					
Freight carrier:					

IMPORTANCE OF THE SHIPPING NOTE

A shipping note is important because it ensures:

- confidence in product delivery;
- updating of stocks and pending quantities;
- payment planning;
- completion of the provisional account statement.

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Invoice reception and control

At this stage, quality control is carried out on the merchandise that has been received. If the merchandise is acceptable, the administration will make the necessary payment.

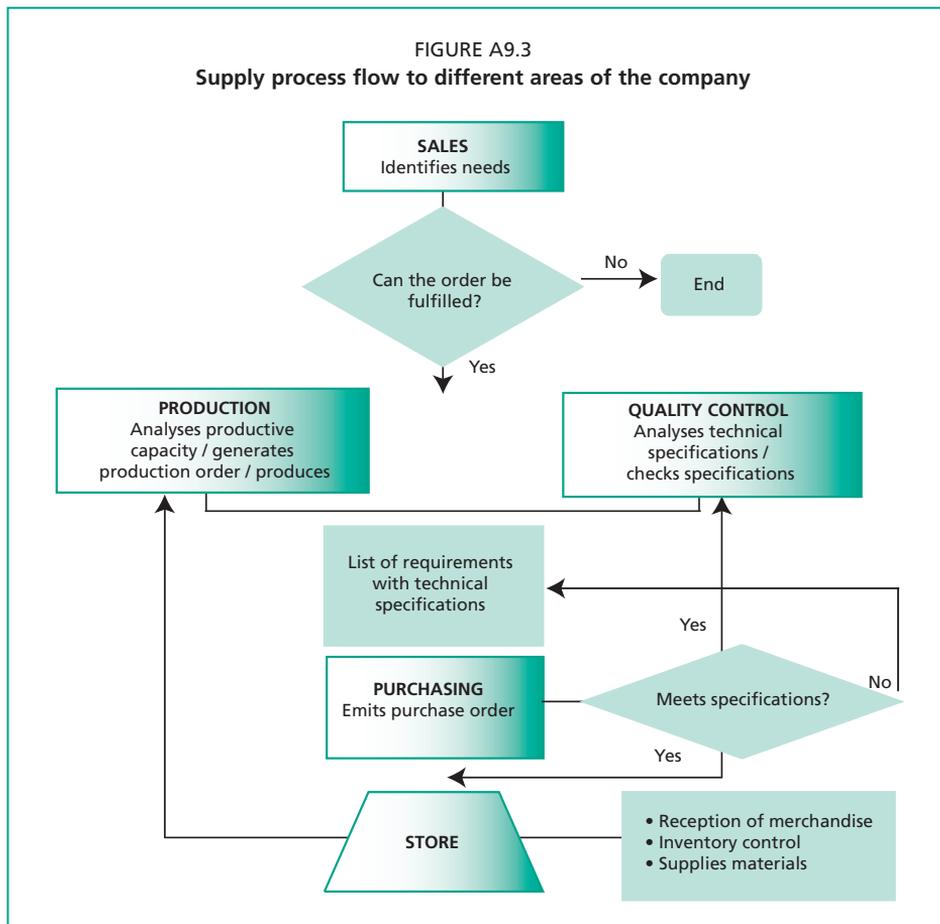
Key process: checking the conformity of the invoice

Assessment of suppliers

This topic is discussed in Appendix 11. Figure A9.3 shows the supply process and the relationship between purchasing and other areas.

COORDINATION AND COMMUNICATION BETWEEN THE PURCHASING DEPARTMENT AND OTHER AREAS OF THE COMPANY

The purchasing manager should maintain a close relationship with all other managers responsible for the different areas of the company because they are internal customers of the purchasing department. The purchasing department has a close relationship with the accounting, production, sales, quality control and



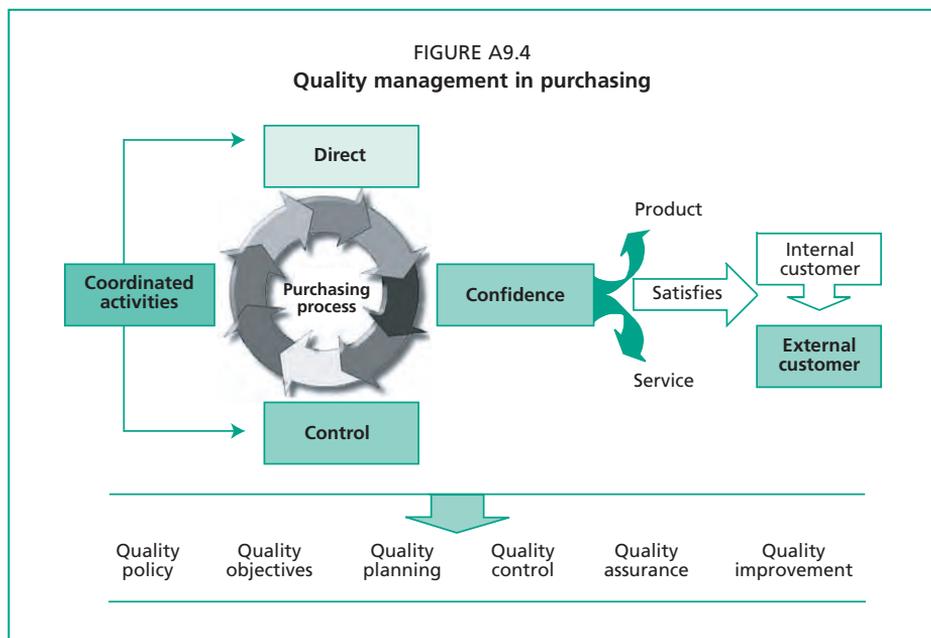
storage departments. However, the production department is the one that makes the greatest use of the purchasing department’s services.

Quality control and the purchasing department

Quality control is one of the most important factors in achieving consistency and confidence in all products involving fresh fruit and vegetables. As with all aspects of marketing, quality control requires careful planning, research, administration and discipline, together with regular training and reviews of procedures. The supplier must therefore implement a programme that incorporates worker training and good practices. These measures should prevent the recurrence of any problems that could lead to a loss of income and prestige.

Quality management in purchasing

All the points defined above are necessary to ensure high quality; they are achieved by means of appropriate quality management in purchasing. These points are illustrated in Figure A9.4. Quality management requires a set of coordinated activities (planning and programming) to direct and control the purchasing process to ensure that only reliable products that satisfy customers’ needs are purchased. The following planning actions are required to meet the objectives of the company’s established policies: (i) collection of data; (ii) determination of goals and objectives; (iii) formulation of general and detailed plans. Programming consists of arranging this set of actions into a specific sequence and time frame.



Source: Logistic management (undated).

The purchasing manual

The basic structure underpinning quality management for purchasing activities is the purchasing manual. This acts as a guide for the department. It describes the department's quality policies, objectives and organization and identifies the operations it performs. The purchasing manual should follow the lines of the general manual and should promote operational efficiency by identifying the responsibilities of each position and the actions to follow, in line with company policy. It should also contain instructions concerning the performance of operations so that it can be used as a reference document for resolving any problems that might occur in the operation of the purchasing department.

Appendix 10

Cooperation between actors: the key to quality and safety throughout the supply chain

Cooperation involves joint efforts to achieve a common objective. Through cooperation mechanisms, companies or people voluntarily agree to pool their strengths in order to achieve a common goal. In this case, the objective is to ensure product quality and safety throughout the agrifood chain.

The new approach to quality and safety management systems involves an understanding of: (i) the relationships between the different actors that form part of the product supply chain and (ii) the responsibility they share in maintaining product quality and safety. Strengthening relationships between the relevant actors is essential to ensuring quality and safety along the entire supply chain. Cooperation through alliances and different mechanisms for working together is the key to success in this field.

SOME OF THE REASONS WHY COOPERATION IS VITAL IN SMALL AND MEDIUM AGRO-INDUSTRIAL ENTERPRISES

Agro-industrial enterprises use many coordination and integration mechanisms, such as strategic alliances and full operational integration. For example, they may produce raw materials themselves and market the products directly as a way of reducing the uncertainty involved with suppliers and product marketing. Cooperation and integration initiatives (e.g. mergers, strategic alliances and contracts) are carried out not solely by large companies, but also by small and medium companies where cooperation is crucial for seizing market opportunities and ensuring the company's profitability and sustainability over the long term. Small and medium companies need to:

- Build knowledge and capacity, as well as using the necessary resources to produce safe, quality products. They also need to incorporate innovations and technological developments that help them to optimize their business processes. Small and medium enterprises encounter major constraints and difficulties in this area. Alliances between a company and other entrepreneurs and institutions can help them successfully to implement changes that are vital for achieving their business objectives.
- Create an appropriately competitive environment, for example, through economies of scale, reduction of business costs and permanence in the market

with a consistent supply of products. Cooperation mechanisms are crucial to creating such an environment.

- Reduce constraints relating to credit, technical assistance, high logistical costs and other problems affecting the competitiveness of the industry as a whole. Alliances between companies are key to mutual growth and expansion in this area.

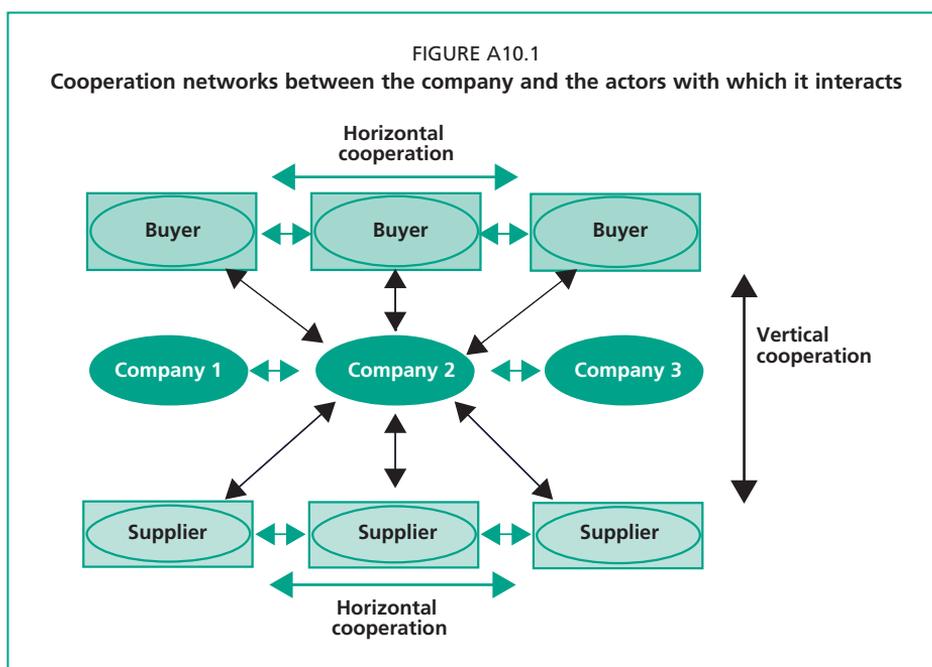
Such cooperation networks can be classified as follows:

- **Vertical cooperation networks** are mechanisms for cooperation between actors involved in different links of the chain. Contacts, consultation and cooperation mechanisms between companies and their suppliers (the link immediately preceding it), or between the agro-industrial enterprise and its customers or product buyers (the next link), form part of vertical cooperation networks.
- **Horizontal cooperation networks** are mechanisms for cooperation between actors involved in the same link of the chain. Producers' associations, export consortia and business associations are examples of horizontal cooperation networks (Figure A10.1).

ADVANTAGES OF COOPERATION IN THE SMALL AND MEDIUM AGRO-INDUSTRIAL ENTERPRISE SECTOR

Some of the advantages of cooperation in the small and medium agro-industrial enterprise sector are:

- greater social impact through working relationships between the government sector, private sector and civil organizations;



- greater availability of resources as a result of pooled efforts and more efficient use of resources;
- cooperation mechanisms strengthen each of the partners, adding value to what each partner knows best and generating concrete and significant results;
- improved social learning where each partner learns from the others, developing new work capacities;
- genuine innovation and relevant and integrated solutions to problems;
- improved competitive position of cooperating businesses;
- focusing the efforts of the companies involved drives the technological innovation process;
- exploiting business opportunities, capturing new customers with lower costs or a better quality/price ratio, establishing closer links with demand or providing more efficient services;
- the possibility of joint investments, which would be difficult to make individually;
- reduced uncertainty concerning the quality, availability, quantity (and sometimes price) of raw materials required for both the production process and customer satisfaction.

KEY FACTORS IN DEVELOPING SUSTAINABLE COOPERATIVE RELATIONSHIPS

Certain conditions are required for the establishment of cooperative relationships. Factors such as the perishability of the product, the level of production systems and increasing demand for quality and safety all contribute to the need for cooperation between actors in the supply chain. However, for cooperative relationships to last over time and produce the desired results, they must be based on mutual benefits for the parties involved. It is therefore important to choose an appropriate partner and define the principles that will govern the agreement. Below are some suggestions:

- Develop relationships based on trust, respect, transparency and shared responsibility.
- Set clear goals for each step in the process; for example, develop a list of objectives, establish priorities and identify weaknesses.
- Before starting to negotiate the terms of cooperation, both parties should clearly specify their requirements and the objectives they expect to attain through the alliance. Honesty is essential. Do not hide or distort your requirements but do not take a rigid position either.
- Share information. Collaboration should be part of the process from the beginning, and expectations and commitments should be established clearly and openly.
- Encourage the development of trust. Some of the parties should take the initiative and demonstrate their willingness to be frank. Lack of trust is an obstacle to the success of the partnership.

- Listen to the other party's requirements, because when these are understood any differences and common points can be identified before going on to explore options that satisfy both parties.
- Do not approach negotiations with the attitude of confronting a rival. The objective is for both parties to gain (win-win). If one of the parties loses, the result is worthless.
- Put difficult topics on the table. Inform your future partner of your non-negotiable points.

STRENGTHENING THE CLIENT/SUPPLIER RELATIONSHIP

The agro-industry creates economic links in the supply chain. It creates *forward links* to the final product markets in order to assess consumer reactions to the food products offered, as well as any changes in consumer preferences and expectations. It creates *backward links* to the producers of raw materials that allow agro-industries to transmit market signals to farmers that may have an economic impact on farmers' production decisions.

A company wishing to implement cooperation mechanisms should establish its strategy on the basis of the problem to be solved and/or the opportunities that would be created through cooperation with suppliers. In the example given, the company applies the planning principles specified in Theme 4 of this module, making it company policy to improve supplier management through cooperation as a means of improving the quality of raw materials arriving at the plant.

Step 1: Identification of partners

After identifying its need for cooperation, the agro-industry evaluates and selects potential partners, which includes not only suppliers but also support institutions that may contribute to solving the problem of poor-quality raw materials.

Step 2: Identify a common purpose – identify the reason why it is worth cooperating

Clarity of purpose is one of the key factors for successful cooperation. When identifying the common purpose for cooperation it is essential to formulate the objectives, strategies, actions and resources that will be involved simply, clearly and in a participatory manner. This information forms part of the cooperation action plan.

Step 3: Identify strategies

This part of the action plan involves determining what must be done to solve the problem, such as training, arranging credit and supporting work organization for producers.

Step 4: Define functions, responsibilities and commitments

These should be defined in accordance with each partner's strengths and capabilities.

Step 5: Define values and forms of organization

Establish the principles on which cooperation will be based and the way in which actors will be organized to carry out the activities in the action plan.

Step 6: Evaluate global and specific results

Based on the results from the monitoring process, the actors involved in the alliance jointly analyse what has been done well and what has been done poorly. Then they take the necessary measures to improve the weakest areas that are hampering the achievement of their objectives.

Step 7: Correct and improve

Implement the measures identified in the previous step, evaluating and improving as part of a continuous process.

BENEFITS OF COORDINATED WORK

In the case illustrated, the benefits of cooperation in the first year were reflected in the following achievements:

- The quality of the raw material improved, a good working team was established, and trustworthy producers benefited from access to the technological changes required to achieve the established goals.
- The internal potential of the company and its producers was improved; the most advanced technology was made available to suppliers, enabling them to improve their yields and the quality of raw materials substantially.
- Consensus and mutual benefits were achieved by means of commitments by both parties. For example, it was agreed that the company would extend the deadline for receiving raw material and, in turn, the producers agreed to ship higher-quality material.

Appendix 11

Supplier approval

A supplier wishing to work for a company with a supplier approval system must obtain approval before being able to supply its products or services. The approval process may be carried out in a number of ways.

AUDIT

A visit is made to the supplier to evaluate a series of previously defined factors. The supplier is given a rating on the basis of which approval is granted or denied.

PRODUCT TRIAL

The company uses the product that the supplier wishes to supply in its production process and the product's performance is assessed.

HISTORICAL APPROVAL

This is used for suppliers that have been working satisfactorily with a company for some time. An analysis is made of the quantities supplied, the results of control checks, the number and severity of complaints and the quality of service.

APPROVAL QUESTIONNAIRE

This is similar to the audit, but does not involve a visit to the supplier. A questionnaire is designed and sent to the supplier. Approval is dependent on the answers received. The people who should participate in the approval process are those responsible for purchasing and quality maintenance within the relevant departments (production, storage, etc.). The list of approved suppliers should be circulated to all company employees responsible for purchasing so that nothing is acquired from suppliers that are not on the list. Once a supplier is approved, ensure that the initial expectations are maintained over time. This requires regular assessment.

SUPPLIER RE-ASSESSMENT

Re-assessment of suppliers is becoming an increasingly common practice. It consists of frequent performance assessments by examining records relating to the entry of raw materials into the plant to determine whether suppliers should retain their rating. If not, the areas where the supplier needs to make improvements should be identified. The reports or records generated by the re-assessment process should be communicated to suppliers clearly and coherently. They should be as specific as possible to facilitate action by the supplier to correct the problem. Small and medium enterprises should develop simple criteria for supplier

assessment and re-assessment. Table A11.1 shows an example of the steps taken by one agro-industrial company to strengthen relations with its suppliers and to improve its competitive position in the target market.

BENEFITS OF COORDINATED WORK

In the case illustrated, the benefits of cooperation in the first year were reflected in the following achievements:

- The quality of the supplier's raw material improved, a good working team was established and trustworthy producers benefited from better access to the technological changes required to achieve the established goals.
- The internal potential of the company and its producers was improved, and the most advanced technology was made available to suppliers, enabling them to improve their yields and the quality of raw materials substantially.
- Consensus and mutual benefits were achieved by means of commitments by both parties. For example, it was agreed that the company would extend the deadline for receiving raw material and, in turn, the producers agreed to ship material of higher quality. As a result, rejects of materials fell from 15 percent to 7 percent.
- The links between the suppliers and the company were strengthened, which allowed both parties to grow, especially the company (through the development of new, higher quality products and timely delivery of raw material).

ELEMENTS TO CONSIDER IN STRENGTHENING THE COMPANY/SUPPLIER RELATIONSHIP

Supply management

Agro-industrial companies may choose one of three options for procuring the raw material they need for their operations: (i) buy or rent land to produce the material needed; (ii) acquire raw material from buyers or intermediaries in wholesale markets or local markets, according to supply and demand or (iii) establish relationships with specific suppliers to coordinate the need for materials with these suppliers' production capacities (Diaz, 1999). The option of producing raw materials is hardly feasible in the small and medium agro-industrial sector. Similarly, the strategy of buying products in wholesale markets according to supply and demand is risky. The most viable option is therefore to build cooperation networks with suppliers that offer a product with the quality specifications and timeliness that the company requires.

For this strategy to be successful, the company should have a unit that is responsible for:

- a. selecting suppliers;
- b. defining the quality specifications;
- c. product presentation;
- d. communicating these requirements to suppliers;
- e. drawing up contracts and purchase orders;

TABLE A11.1
Strengthening the client/supplier relationship

	Step 1	Step 2	Step 3	Step 4	Step 5	Step 6	Step 7	Step 8
Identify the need for cooperation	Identify partners (strengths)	Identify common purpose	Identify strategies to achieve objectives	Roles, commitments and responsibilities	Identify values and how to organize	Identify mechanisms for monitoring and assessment	Evaluate general and specific results	Correct and improve
<p>Company: Dampier Agro-industries</p> <p>Processing of artichokes</p> <p>Competitiveness</p> <p>Increasingly strict quality and safety requirements in markets</p> <p>Problem</p> <p>The company lacks the capacity to maintain a permanent supply of products of consistent quality that satisfies the demands of the target market</p>	Producers' associations, universities, agrochemical distribution companies, local banks, institutions promoting innovation, non-governmental organizations	Promote enterprise development, with social inclusion, generating benefits for producers and purchasing companies, as well as, indirectly, contributing to the development of municipalities			Transparency, inclusion, shared responsibility, excellence, loyalty, trust, respect, honesty	How are we doing? What are our results? What should be improved?	After one year the company will have reduced by 15% the percentage of rejects of raw materials entering the plant	Identify and implement actions
	Coordination between actors							
<p>Main causes of the problem</p> <p>Problems associated with poor quality during processing of the product in the plant</p> <p>Low quality of raw material entering the plant</p> <p>Strategic planning</p> <p>Vision: to be the leading company at national level in the production of processed artichokes that satisfy export markets</p> <p>Mission: to process artichokes of excellent quality to serve export markets</p>								

MODULE
3

TABLE A11.1
Strengthening the client/supplier relationship (Continued)

	Step 1	Step 2	Step 3	Step 4	Step 5	Step 6	Step 7	Step 8
	Identify partners (strengths)	Identify common purpose	Identify strategies to achieve objectives	Roles, commitments and responsibilities	Identify values and how to organize	Identify mechanisms for monitoring and assessment	Evaluate general and specific results	Correct and improve
Identify the need for cooperation								
Company: Dampier Agro-industries								
Processing of artichokes								
Policies					Committees, working groups, etc.	Company records, partnership records, number of loans that have been approved, etc.		
Improve quality management of the processes carried out in the plant; improve quality management starting with suppliers								
Objective of improved supplier management								
90 percent of raw material entering the plant meets the established quality criteria								
Causes of poor quality management at producer level								
Technology: low technological level, lack of experience in crop production, inappropriate use of agrochemicals, etc.			Training/technology transfer/ access to credit	Universities/ non-governmental organizations (NGOs)/ company/bank				
Management: no record-keeping of the quality produced.			Training and incentives	Universities/ NGOs/company/bank				
Marketing: sell to the company when its prices are more competitive than those of intermediaries			Procurement planning/ conclusion of contracts	Universities/ NGOs/company/bank				
Associations: low level of organization (associations exist but are ineffective)			Training and incentives	Producers' associations				
Finance: constraints on access to credit that would allow new production methods to be adopted (such as upgrading of rural irrigation)			Training/ funding for investments	Company/NGOs Purchasing Company/local bank				
Coordination between actors								

- f. checking the reception and quality of raw material;
- g. resolving disputes with suppliers;
- h. checking that invoices are paid;
- i. dealing with any problems that arise and finding immediate solutions, thereby preventing any holdups or errors that could threaten the company's stability.

Appendix 9 details the steps involved in the purchasing process for any product/raw material required by an agro-industrial company. In this section, the focus is on quality control and supplier assessment and selection by the company.

QUALITY CONTROL OF RAW MATERIALS

Quality control at reception is one of the most important steps in quality management because, to a large extent, the quality of the raw material entering the company determines the quality of the final product. Quality control of raw materials entails planning, research, administration and discipline, together with regular training and a continual review of procedures. The basic structure underpinning quality management for purchasing activities is the purchasing manual. This acts as a guide to quality policy and objectives, the company's purchasing process and the definition of the operations that it will perform. It includes the procedures to be followed for the control of the raw materials entering the plant, based on established specifications.

Below are some quality management considerations to be taken into account in the plant reception area:

- The employees working in the product reception area should understand the product technical specifications clearly (e.g. colour, size, defects, presentation).
- The purchase order or purchase contract should describe precisely the quality requirements for the product.
- Suppliers should be informed of the requirements demanded by the buyer in terms of product quality and presentation.
- Quality control should be conducted on the raw material and inspection and testing must be carried out to check that all requirements are met.
- Raw materials received from the supplier should satisfy all the quality and other requirements established in the purchase order or contract.
- Records should be kept indicating the quality of the product received by each supplier, specifying the causes of any rejection or return of the material when it fails to meet the quality specifications.
- Specifications should give the supplier a clear idea of the quality being requested.

THE QUALITY MANAGEMENT APPROACH STARTING IN THE FARMER'S FIELD

The new process approach to quality means that buyers must work very closely with suppliers to identify the main factors that prevent compliance with quality

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requirements. They should also support measures for the prevention and/or control of the causes of quality and safety deterioration in the product, starting in the farmer's field. The objective is to develop clear and realistic quality specifications and to work with suppliers in a cooperative manner to ensure that these targets are achieved.

Cost-effective management tools for ensuring food quality and safety

FOR SMALL AND MEDIUM AGRO-INDUSTRIAL ENTERPRISES

The purpose of this manual is to improve and build the capacities of small and medium agro-industrial enterprises in order to guarantee the quality and safety of food products. The approach integrates the different factors that affect the capacity of a business to produce foods to meet market expectations and recognized standards, while maintaining and increasing the profitability and life of the business. Management and technical aspects are integrated through a practical and cost-effective approach.

The manual includes four modules on the following subjects: the use of market information for improving quality management; systems and tools for improving quality and safety management in agro-industry; the application of quality management principles in small and medium agro-industrial enterprises; planning as a tool for improving quality and safety management.

The manual contains case studies, exercises and bibliographic references, as well as a trainers' guide, PowerPoint presentations (on CD-ROM), appendices with further reading, links of interest and a glossary. The manual aims to assist trainers and entrepreneurs wishing to use the material for self-learning. With this manual, the Food and Agriculture Organization of the United Nations (FAO) provides the small and medium agro-industry sector in developing countries with an important tool for improving competitiveness and the capacity to deliver high-quality products to consumers.

Module 3: Application of quality management principles in small and medium agro-industrial enterprises

Cost-effective management tools for ensuring food quality and safety

FOR SMALL AND MEDIUM AGRO-INDUSTRIAL ENTERPRISES



Module 4: Planning as a tool for improving quality and safety management



Cost-effective management tools for ensuring food quality and safety

FOR SMALL AND MEDIUM AGRO-INDUSTRIAL ENTERPRISES

Module 4: Planning as a tool for improving quality and safety management

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Foreword

The Rural Infrastructure and Agro-Industries Division (AGS) of FAO works to improve and strengthen the capacities of small and medium agro-industries, the enterprises that provide them with services and materials and the relevant support organizations in order to ensure food quality and safety. It carries out these activities using an approach that integrates the different factors affecting the capacity of a business to produce foods to meet the demands of the market according to recognized standards, while maintaining and increasing the profitability and viability of the business. Management and technical aspects must be integrated within a practical and cost-effective approach. This ensures that higher incomes, sources of jobs and the food security of the rural population are also promoted.

The training manual entitled *Cost-effective management tools for ensuring food quality and safety – for small and medium agro-industrial enterprises* focuses on these objectives.

This manual is the result of a collaborative effort by technical staff of the Rural Infrastructure and Agro-Industries Division of FAO. It is based on case studies carried out in Bolivia and El Salvador on opportunities for the improvement of capacity of small- and medium-scale food processing enterprises, through training to meet the demands of the market.

These case studies, which were carried out as part of the FAO programme ‘Agribusiness Development: Small and Medium Post-production Enterprises’, identified the training needs of small and medium fruit and vegetable agro-industries. This sector had been chosen as representative of the food industries operating in Latin America.

In Bolivia, a range of agro-industries was evaluated. These produced: (i) processed dried fruits, jams and/or fruit pulps, particularly pineapple and peaches; (ii) processed vegetables such as faba beans and garlic; (iii) various processed products such as pickles.

In El Salvador, the study focused on the development of products such as tomato-based foods, fruit juices and nectars (including peaches, apples, grapes and tropical fruits), as well as other fruit and vegetable products. This made it possible to identify problems common to the different enterprises, such as low-quality raw materials, inefficient processing operations, lack of knowledge of the relevant quality and safety standards and their implementation and lack of entrepreneurial vision. There was a consensus among small-scale entrepreneurs that these problems could be overcome by implementing innovative training strategies. This consensus led to the idea of preparing this manual.

The manual is divided into four modules, each subdivided into themes. Module 1 discusses the use of market information as a tool for business decision-making. Module 2 covers systems and tools for improving the management of food quality and safety in agro-industry. Module 3 focuses on the principles of quality

management in small and medium agro-industrial enterprises. Module 4 discusses planning as a tool for the management of food quality and safety.

This manual includes case studies, exercises and bibliographic references, as well as a trainer's guide, PowerPoint presentations, appendices, further reading and links of interest.

The purpose of this manual is to assist trainers and entrepreneurs wishing to use the material for self-learning. With this manual, FAO can now provide the small and medium agro-industry sector in developing countries with an important tool for improving its competitiveness and its capacity to deliver high-quality products to consumers.

The English version has been revised to include references, recommended reading and links suitable for English readers. In Module 2, information on standards and regulations relating to quality and safety has been included in order to provide norms that are relevant worldwide.

Geoffrey C. Mrema

Director

Rural Infrastructure and Agro-Industries Division

Acronyms and abbreviations

FDA	Food and Drug Administration (United States)
GAP	good agricultural practices
GMP	good manufacturing practices
HACCP	hazard analysis and critical control points
ISO 22000	ISO standard on food safety management systems
ISO 9000	family of ISO standards on good quality management practices
SENA	Colombia's National Training Service
SWOT	strengths, weaknesses, opportunities and threats
US\$	US dollars

Study guide for the module

PLANNING AS A TOOL FOR IMPROVING QUALITY AND SAFETY MANAGEMENT

Objectives

- Describe the nature, purpose, advantages and constraints of planning in small and medium agro-industrial enterprises
- Present guidelines for applying planning principles as a tool for improving quality and safety management

Content

Theme 1: Planning as a tool for improving quality and safety management

- Planning principles for small and medium agro-industrial enterprises
- Planning in agro-industrial enterprises
- The planning process in small and medium enterprises

Activities

Case study: Planning in agro-industrial enterprises

- Exercise on Theme 1

Assessment

On completion of Theme 1 an exercise is carried out to check the participants' general understanding of the theme

Theme 1: Planning as a tool for improving quality and safety management

INTRODUCTION

The importance of planning and developing action plans has been emphasized repeatedly in previous modules. We defined action plans for agro-industrial companies as documents that specify initiatives for improving and assuring the quality and safety of agro-industrial products and, in general, as useful tools for guiding the company's activities.

Module 1 explored the market for an enterprise's outputs and the relationship between the enterprise and the market. Module 2 discussed the concepts of quality and safety, together with the need to incorporate quality and safety management systems into agro-industrial enterprises. Module 3 described and defined the processes involved in quality management, including their interactions, in a process flow chart. Theme 2 of Module 3 introduced planning concepts, together with the importance of defining a company's mission, vision, policies and objectives.

Although it is impossible to predict the future with any accuracy, planning is a tool that helps to outline the company's future while defining an orientation and focus for its resources in order to achieve its objectives. The planning process entails a careful analysis of the external and internal factors that can affect the achievement of objectives; plans are the result of a process in which clear objectives are defined and activities are identified. The company must carry out the activities successfully in order to achieve these objectives.

Planning is an iterative process in which the same process feeds back into itself (McGillivray, 1998). During the planning process, new factors are discovered that must be taken into account. It is an integrated process that makes it possible to consider information on the market, on technical and financial topics and on the human resources needed to implement or develop the plan. It demands effort and time, which is not always available in small and medium companies. Planning should not be seen as something special or extraordinary to be used only when change is needed in the company. It should always be viewed as a systematic, ongoing process. For this reason the process should be simplified as much as possible.

There are a number of reasons why it is important to plan:

- i. A plan indicates whether the company can expect to obtain profits in the future, and whether these will be greater or less than current levels.

- ii. It also shows which part of the company or business can be improved.
- iii. It provides information on how much money can enter or leave the company in a specific time period.
- iv. It facilitates efficient communication between partners and employees.
- v. It allows the progress of the company as a whole or of a specific area within it to be measured.

Chapter 5 of standard ISO 9000 refers to planning when it states that company management *should ensure that quality objectives are established in the relevant functions and levels inside the organization. The quality objectives should be measurable and coherent with policy.* It also states that senior managers should ensure that *the quality management system is implemented in accordance with the objectives* and that *the integrity of the management system must be maintained when changes to the system are planned and implemented.*

The introduction of any quality and safety management system, good agricultural practices (GAP), good manufacturing practices (GMP), hazard analysis and critical control point (HACCP), ISO 9000 or ISO 22000 requires the utilization of planning tools. These tools allow management to plan, systematize and organize changes and also to measure, control and improve the system over time. It is very important for small and medium agro-industrial companies to introduce these principles in a simple and consistent manner. If necessary, external consultants can be used to facilitate this task.

This module brings together some of the ideas that have been presented in previous modules and examines the elements to consider when putting planning principles into practice.

EXPECTED RESULTS

By the end of this theme, participants are expected to have a better understanding of:

- the usefulness of the planning process as a tool to help organize a company's efforts and resources efficiently to achieve its objectives;
- the methodology for analysing a company and its environment on the basis of its strengths, weaknesses, opportunities and threats (SWOT analysis);
- the importance of planning based on objectives, goals and action plans, which allows the performance of the company's processes to be assessed;
- the sequence of steps to follow in the application of planning principles in an agro-industrial company.

ESTIMATED TIME

Six hours, including the time required for the classroom sessions, practical exercises, review of materials and other activities.

SUPPORT MATERIALS

Case study: Planning in agro-industrial enterprises.

Reading for the theme: Planning principles for small and medium agro-industrial companies.

PowerPoint presentation: Module 4.

Exercise for Theme 1.

Case study**Planning in agro-industrial enterprises****Plan for exporting canned *piquillo* pepper to the United States market****The idea**

An agro-exporting company in Peru decided to explore diversification opportunities by entering the export market for *piquillo* pepper to the United States of America. Peru is the leading exporter of *piquillo* pepper to Spain, which, in turn, is the leading supplier to the North American market, mainly by re-exporting the Peruvian product. The company's objective is to export the Peruvian product to the United States market directly.

The external environment

Productivity of *piquillo* pepper is high in the coastal valleys of Peru and the product is of high quality. The technology necessary for processing is available and there is a strong trend towards economic and trade integration with the United States of America. Under these circumstances, the company is planning to take advantage of the opportunity to consolidate itself as the leading exporter of *piquillo* pepper to this market.

The company is preparing to implement measures to obtain a final product of export quality. This would differentiate it from current offerings because the product would be delivered direct to United States ports as required by the importing customer.

Even though Spain is the largest consumer of *piquillo* pepper, the United States of America has been selected as the target market for the following reasons:

- i. higher prices are paid for imported canned Peruvian *piquillo* pepper in relation to other markets;
- ii. it is located close to Peru;
- iii. it has a large capacity to expand consumption;
- iv. the existence of current and potential trade agreements between the two countries.

Piquillo pepper is consumed mainly in Spain, France, Greece and Italy. It is served as a starter in restaurants and bars. In the United States, the product is consumed mainly by ethnic groups from European and Latin American countries, but its consumption has gradually been adopted by the general population. Demand has also been expanding through the adoption of European food habits by returning American tourists.

How is the target market reached?

The company's strategy for penetrating the target market is to develop commercial relations with key importing companies. The product would be sent to them with the corresponding labels. This strategy promotes the establishment of long-term relationships in order to ensure the success of the plan. Accordingly, the company would adjust its activities to provide a standardized product of extra-grade quality *piquillo* pepper with specific characteristics: weight, size, colour, quantity of seeds and integrity of the surface, as well as complying with international demands relating to GAP, GMP and HACCP.

The operational strategy involves the acquisition of a processing plant to give the company total control of the operation. The company is also beginning to grow the raw product on rented land to increase its control over production and ensure a more uniform and higher quality product. As cash is being generated in the medium term (over the first four years), the company plans to purchase agricultural land to ensure permanent production of canned *piquillo* pepper in the future.

Is the project profitable?

The project financial assessment reflects a net present value of US\$1 007 064 with a payback period of approximately three years, considering an assessment period of 10 years with quarterly terms. The initial investment required for the project is US\$752 183. A sensitivity analysis has shown that the most sensitive variables, in order of importance, are: price, the cost per container and the volume of exports by container. The break-even point is 224.75 tonnes of *piquillo* pepper (canned net weight). It is estimated that, at the start of the project, the company would export approximately 214 tonnes of the extra-grade quality canned products at a cost, insurance and freight (CIF) price of US\$2 716 per tonne. This amount would increase by 6 percent annually, supported by expansion of the production area from 40 hectares to 60 hectares by year 8 of the project.

Where will resources come from to implement the plan?

In view of the results of the planning exercise, the company has decided to spread its risk by entering into an alliance with a strategic partner that will provide the financial resources necessary to support the plan. The financing required to cover the working capital is US\$225 655, which represents almost 43 percent of the total capital investment of US\$526 528 required to start the project.

Source: *Plan para la exportación de pimiento piquillo en conserva al mercado de Estados Unidos de Norteamérica* by Rodríguez et al. ESAN Graduate School of Business (Escuela de Administración de Negocios para Graduados), Peru, 2005

CRITERIA FOR ANALYSING THE CASE

After reading this case carefully, carry out an analysis by attempting to identify:

- the key aspects taken into account by the team that prepared the export diversification plan;
- the opportunities and strengths that the plan aims to exploit;
- in what way the proposed plan could be improved, for example, by obtaining further information to help the company to reduce uncertainty and minimize the risk of making poor decisions;
- the lessons learned that your company could apply or consider.

The same tasks are listed at the end of Module 4 so that they can be completed based on the newly acquired knowledge.

Reading for Theme 1

Planning principles for small and medium agro-industrial enterprises

THE IMPORTANCE OF PLANNING IN AGRO-INDUSTRIAL ENTERPRISES

Planning is the process of organizing available resources to carry out the actions required to achieve defined objectives and goals, as well as monitoring the expected results. Planning is a tool that helps to focus the efforts of a company's different departments on achieving specific objectives. Lack of planning, or poor execution because of lack of sufficient and reliable information, has negative consequences for the company, as Table 1 below shows. One of the principal objectives of any commercial activity is to attain consistent profitability. Lack of planning results mainly in higher costs and inefficiencies at all levels, resulting in lost opportunities for improving profitability and harm to the company's competitive position in the market, as Figure 1 shows.

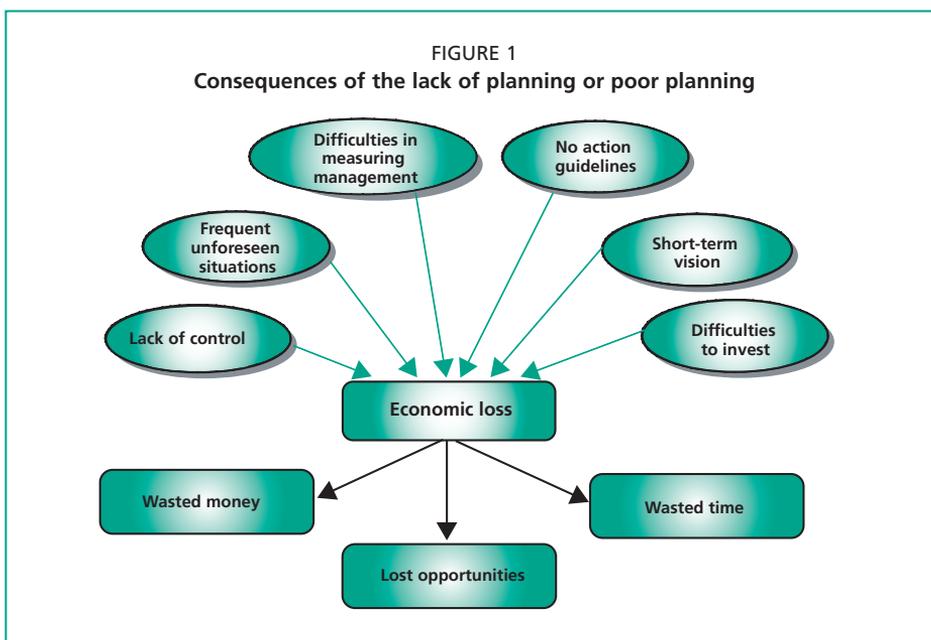
ADVANTAGES OF PLANNING

The advantages of planning include:

- Improved communication inside the company. Plans – strategic or operational – are communication instruments because they define the company's orientation,

TABLE 1
Problems derived from poor planning or lack of planning

Immediate problems (occur in the short term)	Consequences (occur in the medium to long term)
Lack of control	<ul style="list-style-type: none"> • No clarity on the scale of the problems • Lack of clear objectives means that the company must yield to pressures from suppliers and customers
Frequent unforeseen situations	<ul style="list-style-type: none"> • Constantly changing the company's operations • No concrete objectives; management keeps 'putting out fires'
Difficulties in measuring performance	<ul style="list-style-type: none"> • Lack of indicators to measure company performance • Lack of indicators to assess how well resources have been used
Lack of a consistent action guide	<ul style="list-style-type: none"> • Lack of leadership in the management of the company • Reacting to changes rather than anticipating them
Short-term vision	<ul style="list-style-type: none"> • Problems are resolved on a day-to-day basis; there is no vision of the future • The company is not prepared for changes that may occur in its environment
Lack of judgement when deciding on investments	<ul style="list-style-type: none"> • Investments produce poor yields • Imbalance and inconsistency between investment costs and benefits



together with the goals for the company as a whole and for each of its departments.

- Building entrepreneurial capacity because, in order to prepare plans, company employees need to know, analyse and reflect on internal aspects of the company, its departments and its functions, as well as the external environment.
- Improved external relations because planning facilitates communication between the company and external agents, such as:
 - **financial entities** (well-prepared plans create credibility with credit institutions);
 - **suppliers** (plans make it easier to communicate the company's objectives to its suppliers, who are strategic partners in achieving these objectives);
 - **customers** (plans create credibility and confidence among the product's buyers).
- Planning allows results to be checked as they are received and adjustments to be made to the original plans. For example, if the objective is to improve quality, it is necessary to focus on defining the improvement and to quantify the desired results.

PLANNING IN AGRO-INDUSTRIAL ENTERPRISES

As mentioned in Theme 2 of Module 3, planning is a management tool that allows a company to decide in advance what it should be doing, who should be doing it and how it should be done to meet specific objectives. In an agro-industrial enterprise, planning can take place at two levels: strategic and operational.

The result of any planning process is a written document called ‘the plan’. Strategic plans are prepared with the aim of achieving the company’s general objectives and operational plans indicate how the strategic plans are to be implemented in order to achieve the strategic business objectives. For example, the business plan is a strategic planning document aimed at carrying out business ideas. It contains, in a comprehensive and detailed form, the vision and mission of what an entrepreneur wants to achieve and the products and markets to be dealt with. In contrast an operational plan (such as the HACCP) implements the quality and safety assurance strategy identified in the company’s strategic plans.

The planning process involves the following steps:

- identifying objectives;
- analysing the current situation;
- identifying strategies to achieve the desired situation;
- setting goals (indicators for achieving the strategy);
- defining activities.

A company bases its strategy on continual improvement, an iterative process, by adding the following steps:

- implementing the plan;
- checking its effects;
- analysing results and planning the appropriate actions.

The planning process starts with a clear statement of objectives. The statement of objectives must begin with a clear definition of the overall mission and vision of the enterprise. This is the starting point for formulating strategic plans. The company’s mission, vision and policies are defined for the medium term and are reviewed annually, even when there are no changes. However, the objectives should be reviewed more frequently, depending on the products and on the production and marketing cycle. In any case, the objectives should be reviewed at least once a year to identify new goals and action plans for the company to implement.

THE PLANNING PROCESS IN SMALL AND MEDIUM ENTERPRISES

Step 1: Establish general objectives

Define or revise: mission, vision and policy

The **mission** statement is the company general’s objective is the foundation on which its purpose, values and scope of action are built. The **vision** defines the business objective, which answers the question: How do we see the company in the future? The **policy** objectives are what the company must do to achieve its mission.

The mission statement contains three important items:

- information on what the company does;
- the company’s position, or the market it wishes to serve;
- the particular characteristics that differentiate its product.

In addition it describes how these characteristics benefit its customers. The following questions are asked when drawing up the mission statement:

- i. What purpose does the product serve?

- ii. What are the product's distinctive characteristics?
- iii. How do these characteristics benefit customers?
- iv. Where are our customers?

Table 2 includes questions that can help in drafting the company's mission statement. Answers are grouped according to their contribution to the company's goals, markets and potential for growth and development. Table 3 shows an example of a mission statement for an agro-industrial company. The vision and the company's policy can be defined and reviewed in the same way.

Establishing objectives

Defining a company's mission and policy is equivalent to drawing up a map of a zone within which the company determines the places it wishes to reach. The objectives are equivalent to specific points on the map on which the company focuses its efforts. The company should translate the mission and policy

TABLE 2
Questions to help in drafting the company's mission statement

Products	Customers	Product differentiation	Company environment
What is the company's line of business?	Who are the final consumers?	What differentiates the company from its competitors?	Which other sectors affect the development of the company's business area?
Which products does the company offer?	What are the characteristics of the company's main customers?	What does the company do best?	What technological advances have been made in the company's business area?
What benefits do the products provide to customers?	To which segment do they belong?	For which product does the company experience the least competition?	What trends are apparent in the company's business area?
What needs do the products really satisfy?	In which other segments could they be incorporated?	Who are the main competitors?	Which events will positively affect the company's business area?
Why do the products do this?	Why have they stopped buying?	In what areas are competitors superior?	Which events will negatively affect the company's business area?
When do the products do this?	What is the customer demanding that the company cannot provide?		
How do the products do this?	Which are the main markets?		
Which products does the company not offer?			
Why does the company not produce them?			
What are the company's main products?			
Which products offer the greatest benefits?			

TABLE 3

Example of the mission statement for a company and its business area

Mission
To be an agro-export company that supplies mangoes and asparagus to the national and international market. Processes are to be based on the HACCP system, which assures the quality and safety of its products. The company promotes a culture of teamwork with its suppliers, workers and customers and constant respect for the environment.
Business area
Quality fresh fruit and vegetables
Real need that is satisfied
Meeting the need for fresh products in the target market, with optimal quality standards that exceed consumer demands.

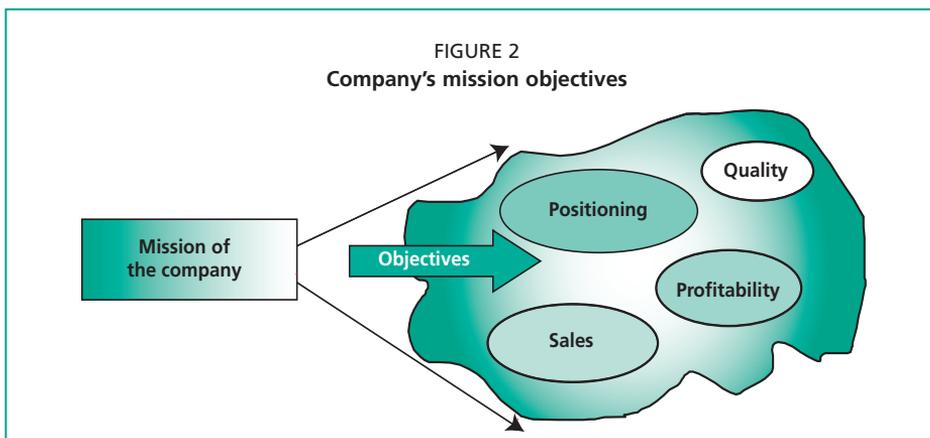
statements into concrete objectives. As mentioned in Theme 2 of Module 3, the objectives should be:

- **realistic and achievable;**
- **clear and precise** with no margin for questionable interpretations;
- **flexible** to allow for modifications, particularly changes of scale to adjust the company's operations to unforeseen changes in the environment;
- **communicated and generally accepted in all of the company's departments** so that the efforts and responsibilities are kept in balance with the planned activities;
- **controllable, so that** the objectives can be achieved within a specified timeframe, during which operations should be supervised in order to check if everything is under control or if corrective actions should be taken;
- **coherent, with** objectives that are interrelated so that they form part of one global objective;
- **significant and correlated with the resources allocated to achieving them to ensure** a viable relationship between the magnitude of the expected results and the resources that the company plans to invest.

The objectives are established within the sphere of action defined by the mission statement and the business area (Figure 2).

The objectives can be **general or specific**. For example, strategic plans are drawn up on the basis of more general business objectives that are achievable only in the long term. On the other hand, operational plans achieve specific objectives that contribute to the general objectives and are achievable over the short to medium term. In small and medium companies, it is sufficient to begin by defining the mission, vision and policy and then determining simpler general and specific objectives.

Table 4 shows an example of the defined objectives for an agro-industrial company.



Step 2: Analysis of the current situation

Planning is based on knowledge of a company's strengths, weaknesses, opportunities and threats. A SWOT analysis is a strategic tool used to understand a company's current situation. The basic purpose of a SWOT analysis is to assess strengths and determine weaknesses in order to correct them, exploit opportunities and mitigate threats.

External analysis identifies the opportunities and threats that exist in the company's environment that may affect the achievement of its objectives.

Opportunities

These are situations found in the environment of the company that can positively influence the achievement of its objectives

Threats

These are situations found in the environment of the company that can negatively influence the achievement of its objectives

Strengths

The characteristics of the company that facilitate the achievement of its objectives

Weaknesses

The characteristics of the company that limit the achievement of its objectives

Internal analysis focuses on identifying the company's strengths and weaknesses that may affect its capacity to achieve its objectives. Table 5 provides examples of strengths, weaknesses, opportunities and threats defining a company's current situation.

TABLE 4

Example of defined objectives

Export of fruits
General objective
To enter the United States market in 2006 with “fourth range ¹ foods” in the fruit and vegetable category – mangoes and asparagus.
Quality objectives
To meet the quality standards of the United States Food and Drug Administration (FDA) and other regulatory bodies.
To satisfy food needs with fresh, safe products that comply with optimal nutritive and sensory quality standards.

¹ The term ‘fourth range’ refers to fruits and vegetables that have been minimally processed. They are washed, chopped and packaged ready for consumption. The product retains its natural freshness for 7–10 days.

TABLE 5

Examples of strengths, weaknesses, opportunities and threats

Opportunities	Threats
<ul style="list-style-type: none"> • Agreements with suppliers to apply and maintain quality criteria • New uses for the product • Changes in consumption patterns • Acceptability of the products • New niche markets • Introduction of new technologies • Increase in buying power • Rising sales trends • Tax benefits to stimulate exports • Bilateral or regional trade agreements • Reduction in raw material prices 	<ul style="list-style-type: none"> • Declining sales trends • Market in decline • Loss of market share • Economic recession • Scarcity of raw materials or inputs • Increasing competition • Competitive products • New taxes • New technology not accessible to the company • Reduction in buying power • Inadequate machinery
Strengths	Weaknesses
<ul style="list-style-type: none"> • Low production costs • Leadership • Planning system implemented • Good reputation (quality image) • Differentiated products • Consumer-oriented policies • Good distribution systems • Capacity for obtaining external financing • Good level of liquidity • Availability of raw material • Use of technology • Qualified staff • Good quality control • Company well located • Low labour costs 	<ul style="list-style-type: none"> • Obsolete technology • Poor quality products • Lack of planning • Inadequate methods for setting prices • Limited production capacity • Inefficient organization • Inadequate marketing efforts • Lack of financial capacity • Poorly trained staff

Step 3: Consider whether it is necessary to modify the objective to make it more realistic in the current situation

In this step, any of the following alternatives may occur:

- The objective is **retained** if the analysis of positive and negative factors indicates that the objective can be achieved.

- The objective is **revised** if the analysis indicates that it should be improved or reduced owing to positive or negative factors.
- The objective is **removed** if a negative factor that has not previously been considered would prevent its achievement.

Step 4: Establish strategies

What is a strategy?

Strategies define the actions required to meet the objectives. The task for the entrepreneur is to identify the most appropriate and realistic strategies on the basis

TABLE 6
Example of a SWOT analysis

Weaknesses	Ways to overcome them
<ul style="list-style-type: none"> • No experience in the United States market • No knowledge of the practical application of market regulations in the United States of America • No knowledge of consumer trends and specific preferences in the United States of America • Unavoidable seasonal rotation of operators • Operators need to improve their skills 	<ul style="list-style-type: none"> • A commercial and legal consultancy would help to bridge the gap in knowledge of market regulations in the United States of America and the demands and preferences of consumers in this market • Training for operators to improve their skills and behaviour, especially with regard to quality and safety aspects
Threats	Ways to overcome them
<ul style="list-style-type: none"> • Top-quality Brazilian mangoes at highly competitive prices • Cheap Asian asparagus • Limited availability of credit for farmers • High cost of credit • Suppliers are generally deficient on, or fail to apply, GAP 	<ul style="list-style-type: none"> • Implement selective strategies for building customer loyalty in target market segments • Differentiation by quality • Strategic alliances with farmers; training and consultancy for implementation and sustained application of GAP to guarantee product safety
Strengths	Ways to exploit/them
<ul style="list-style-type: none"> • Appropriate infrastructure • Sufficient equipment in optimal operating condition • Highly qualified senior and middle management • HACCP system implemented • Experience in international markets • Financially solvent 	<ul style="list-style-type: none"> • Optimize the use of physical, human and technical resources • Apply the company's technological resources to guarantee product safety; suppliers apply GAP • Consider the possibility of financing or supporting credit for farmers aimed at GAP implementation and sustained application
Opportunities	Ways to exploit/them
<ul style="list-style-type: none"> • Unsatisfied demand for mangoes and asparagus • Organoleptic characteristics of the asparagus variety supplied by the company are highly appreciated by consumers • Non-seasonal, permanent supply of asparagus • Mangoes are supplied in seasons when other countries are not able to supply them • Possible strategic alliances with farmer suppliers to raise standards and assure safety • Covered by the free trade agreement with the United States of America 	<ul style="list-style-type: none"> • Positioning according to quality and opportunity • Strategic alliances with farmer suppliers to raise their standards and ensure product safety • Take advantage of new customs duties under the free trade agreement

of the company’s capacities and resources. A SWOT analysis is recommended for this (Table 6). Each viable strategy should link to the following:

- **Strengths** – analyse and identify to what extent they favour implementation of the strategy.
- **Weaknesses** – identify to what extent they would impede implementation of the strategy.
- **Opportunities** – identify market and environmental conditions that favour implementation of the strategy, and to what extent.
- **Threats** – identify which market and environmental conditions would significantly hinder implementation of the strategy, and to what extent.

These strategies can be combined as follows:

- **SO strategies** use strengths to take advantage of opportunities;
- **ST strategies** use strengths to minimize threats;
- **WO strategies** overcome weaknesses by exploiting opportunities;
- **WT strategies** reduce weaknesses and avoid threats.

Once feasible strategies have been analysed, those with the best chance of success are chosen as reflecting the company’s real capacity. An example is given in Table 7.

Step 5: Set goals

What are goals?

Goals are the results required to achieve the proposed objectives. Goals should be progressive, specific and quantifiable. In order to establish or define goals, it is necessary to have:

- a proposed objective;
- a strategy to achieve the proposed objective.

Table 8 shows an example of setting goals.

TABLE 7
Possible company strategies

Weaknesses/opportunities (WO) strategies	Strengths/opportunities (SO) strategies
<ul style="list-style-type: none"> • Stimulate and support the planning process for mango cultivation, for expanding markets and for reducing staff turnover • Legal and commercial consultancies 	<ul style="list-style-type: none"> • Establish strategic alliances with farmer suppliers to improve their standards and guarantee product safety by means of training and technical assistance with GAP implementation and by supervising their activities
Strengths/threats (ST) strategies	Weaknesses/threats (WT) strategies
<ul style="list-style-type: none"> • The company's middle management trains, advises and supervises the suppliers on GAP implementation • Financing arranged or guaranteed to support suppliers in implementing GAP 	<ul style="list-style-type: none"> • Participate in specialized trade fairs in the United States of America to demonstrate products • Trade mission to the United States of America to establish contacts and identify specific market requirements • Legal and commercial consultancies • Guarantee financing for suppliers for implementing and applying GAP • Training to improve the operational skills of plant personnel

TABLE 8

Example of setting goals

Fruit exporting	
Goals set	
General objective	
<ul style="list-style-type: none"> • To enter the United States market in 2006 with 'fourth range' horticultural products – mangoes and asparagus – that meet United States Federal Drug Administration standards. 	
Selected strategies	
<ul style="list-style-type: none"> • The company's strategy to penetrate the target market includes: <ul style="list-style-type: none"> • Setting up cooperation mechanisms with mango and asparagus suppliers through a partnership with two of the best-qualified suppliers in terms of their product volume and quality, their ability to meet service standards and their reliability • A strategic alliance with a leading supplier of mangoes and a leading supplier of asparagus in the United States market • Product quality and safety assurance 	
Goals for the general objective	
<ul style="list-style-type: none"> • Export 28 tonnes of mangoes to the United States market in 2006 and 2007 • Export 40 tonnes of asparagus to the United States market in 2006 and 2007, thereby increasing total sales from 120 tonnes to 160 tonnes as a result of entering that market 	
Quality objective	
<ul style="list-style-type: none"> • To modify quality standards to ensure that they meet the demands of the FDA and other regulatory authorities 	
Selected strategies	
<ul style="list-style-type: none"> • Establish a strategic alliance with the two selected suppliers in order to improve their standards and guarantee the safety of the product arriving at the plant, through training and technical assistance in GAP implementation and application • Maintain the company's commitment to quality and safety in product processing through HACCP and GMP certification 	
Goals for the quality objective	
<ul style="list-style-type: none"> • Ninety percent of the company's procurement is through contracts with selected suppliers • Ninety percent of the company's suppliers are GAP certified • The company maintains its HACCP certification with a prestigious certification company operating in the United States of America 	

Step 6: Preparing action plans

Once the goals are known, the planning process defines the actions required to achieve these goals. After strategic planning, in which objectives and general goals are defined, the next step is operational planning, which identifies what has to be done to achieve the goals defined in the strategic plan. In all cases, the objectives and goals must be well defined and expressed clearly and precisely. Appendix 2 provides specific tools for drawing up an action plan.

Step 7: Is the plan financially viable?

The final step in the planning process is to estimate the costs and benefits for the company if it carries out the proposed plan. Ascertaining the financial magnitude of the plan makes it possible to:

- determine the total costs, including the administration costs and the staff time required to execute the plan;

- determine the investments needed;
- determine whether it is necessary to use external financing, search for new partners, or seek credit;
- assess the plan's profitability.

Estimating the costs and benefits of the plan is useful in determining:

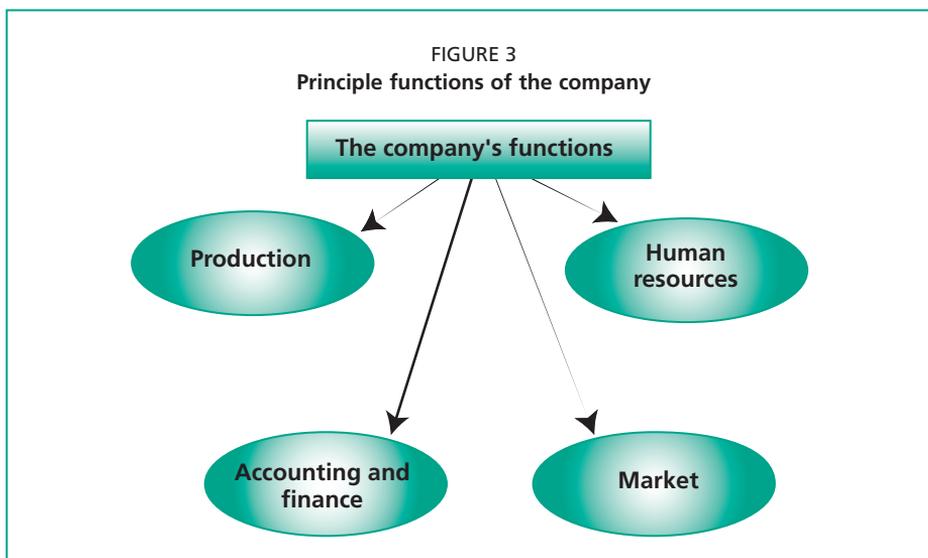
- i. how the proposed plan would contribute to the company's profitability and competitiveness;
- ii. how it would impact the structure;
- iii. in which ways the proposed plan would facilitate the selection of objectives.

Small and medium enterprises are often very ambitious in establishing their objectives and goals but later find that they do not have the economic resources to implement them. It is therefore very important for an action plan to include a budget.

BUDGET PREPARATION

As discussed in previous modules, a company should be organized according to processes or functions, and it should have an integrating or chain approach, from farm production to delivery to the consumer (from farm to fork). It is also very important for the company to be fully aware of its costs and profitability.

A company's principal functions are production, human resource management, marketing and accounting/finance. In any action plan resulting from a planning process (whether a strategic, operational, marketing or business plan), any correction to a company process must be preceded by a cost estimation (Figure 3). The budget contains a forecast of the revenues and costs for a specific activity, usually on an annual basis. It is the basic tool for studying a potential investment



or a change in the company. Appendix 2 presents a methodology for preparing a budget, calculating costs and profits and determining the break-even point.

COMPLETING THE CASE STUDY

Exercise

After reviewing the content of this theme and comparing it with your own experience, review your responses to the tasks listed initially and try to correct or supplement them. Link your replies to the topics that have been covered in this section.

APPLYING THE EXERCISE

Within a continual improvement approach, agro-industrial entrepreneurs should make planning an essential tool for developing the business and for incorporating new ideas or improvements. Conduct the following exercise for applying planning principles in your company.

Step 1

List five changes that you wish to implement in your company. These may vary from very important changes to very simple changes, such as changes in the company's:

- relations with its external environment (markets, suppliers, customers, bank);
- organization, or in the way it carries out a process, incorporates a training plan, etc.

Step 2

Try to prioritize the list of changes, from the most important to the least important, according to your own criteria.

Step 3

Choose the most important change and determine whether the proposed change is related to (or found in) the company's mission statement, objectives, goals or policy.

Step 4

Analyse the internal and external factors that would affect implementation of the desired change either positively or negatively, i.e. carry out a SWOT analysis.

Step 5

Examine the measures or strategies that you could implement to reduce the negative aspects and to exploit the positive aspects.

Step 6

Set a goal resulting from the selected change.

Step 7

Consider what is required to implement the goal.

- Identify the activities that need to be carried out to implement the strategy and to achieve the defined objective:
 - a. Is staff training required?
 - b. Is investment required?
 - c. Is external consultancy required?
 - d. How can staff be motivated to become involved in the change?
- Type of resources required:
 - e. What type of human resources will be required?
 - f. Who should participate in implementing the change?
 - g. How long will it take to carry out the change?
 - h. How much will it cost to carry out the change?
- Which benefits would be obtained from implementing the change?
 - i. What would happen if the change were not carried out?
 - j. How will the change affect the company's revenues?
 - k. Which other benefits will result?

Step 8

Present an action plan in the format indicated in Appendix 2 and discuss it with colleagues in your company.

Assessment of the theme

Additional pages may be used to reply to these questions and directions.

1. Describe briefly the importance of planning in an agro-industrial enterprise.

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2. What is the importance of defining the company’s mission?

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3. The objectives are very important to any plan; describe briefly the aspects to consider when formulating objectives.

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4. Describe two business objectives and their respective strategies.

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5. What information is included in a budget? Indicate how you would use this tool for carrying out your action plan.

.....
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.....
.....

Summary

- Planning is a tool for focusing the efforts of different company departments to achieve specific objectives. The lack of planning, or planning without reliable and sufficient information, has negative consequences for a company.
- Advantages of planning:
 - improves communication within the company;
 - helps to build business capacity;
 - improves external communications;
 - acts as a control instrument.
- Planning at any level is based on a process involving the following steps:
 - identifying objectives;
 - analysing the external and internal situation;
 - identifying strategies to achieve the desired situation;
 - establishing goals (indicators for achieving the strategy);
 - identifying activities.
- For the company, a mission statement is equivalent to having a map of the zone within which the company can determine the places it wishes to reach. Having clear objectives is equivalent to deciding on which specific points on the map the company should focus its efforts.
- The objectives can be general or specific. For example, strategic plans are developed on the basis of more general business objectives that are achievable only in the long term. On the other hand, operational plans are developed on the basis of specific objectives that contribute to the general objectives and are achievable over the short to medium term.
- Planning is based on knowledge of a company's strengths, weaknesses, opportunities and threats. An analysis of these aspects is known as a SWOT analysis. This is a strategic tool for understanding a company's current situation.
- Strategies provide a general guide to the actions required to achieve the proposed objectives and they define the lines of action, or 'how to get there'.
- Goals are the specific, quantifiable and progressive results that must be obtained in order for the proposed objectives to be achieved.
- Action plans are a set of activities that need to be carried out in order to achieve the established goals for a particular objective.
- The final step in the planning process is to estimate the costs and benefits for the company if it carries out the proposed plan. Ascertaining the financial magnitude of the plan makes it possible to:
 - determine the total costs, including the administration costs and the staff time required to execute the plan;

- determine the investments needed;
- determine whether it is necessary to have external financing, search for new partners or seek credit;
- assess the plan's profitability.
- A budget is an instrument for forecasting the economic impact of the set of activities required to achieve the objectives. The budget is very valuable for the company's overall management. It contains precise information on future revenues and expenses over a specified period arising from the company's operations.

References

- Harris, J. & Buló, P.** 2003. *Manual diseño y elaboración de planes de negocios para micro y medianos empresarios rurales. Programa para la Microempresa Rural de América Latina y el Caribe (PROMER)* and International Fund for Agricultural Development (IFAD). Santiago, Chile (available in Spanish at http://www.fidamerica.cl/admin/docdescargas/centrodoc/centrodoc_643.pdf).
- Infoagro.** 2007. *Cuarta gamma: una alternativa de futuro* (available at http://www.infoagro.com/industria_auxiliar/cuarta_gama.asp).
- McGillivray, G.** 1998. *Análisis económico e investigación de mercados para proyectos hortofrutícolas. Manual de capacitación. Servicio Nacional de Aprendizaje SENA.* Colombia.
- Ostertag, C.F.** 2000. *Rural agro-enterprise development project.* Presentation on the fundamentals of business plans. International Center for Tropical Agriculture (CIAT). Cali, Colombia.
- Rodríguez et al.** 2005. *Plan para la exportación de pimienta piquillo en conserva al mercado de Estados Unidos de Norteamérica.* ESAN Graduate School of Business (*Escuela de Administración de Negocios para Graduados*), Library and Information Centre, Peru.

Appendix 1

Recommended further reading on the themes of Module 4

READING 1: A GUIDE TO MARKETING COSTS AND HOW TO CALCULATE THEM

Author: Shepherd, Andrew W.

Published by: FAO, 1995.

Document:

<http://www.fao.org/docrep/U8770S/U8770S00.htm>

Description

The goal of this guide is to explain the concepts and fundamentals of the costs, margins and profits of agricultural marketing. The principal types of costs are specified, concise advice on how to calculate them is given and the interpretation of marketing margins is analysed.

LINK OF INTEREST

Tool: Agriventure

Author: FAO

Published by: FAO, 2004.

Programme: can be downloaded from:

<http://www.fao.org/inpho/isma?i=INPhO&m=decision&p=Download&lang=en>

Description

FAO has developed *Agriventure* as a programme tool for preparing and evaluating an agro-industrial project. This programme guides users through the process of entering data and the required analyses for the formulation of an agro-industry investment project. *Agriventure* follows all the steps in the calculation of needs in terms of raw materials and inputs, estimation of costs for products, utilities, requirements for working capital and fixed capital financing schemes, as well as all the details necessary for a comprehensive assessment of the financial feasibility of the project.

Appendix 2

Preparing an action plan

Small and medium companies can draw up a simple version of the action plan and the timetable of activities, as well as the plan monitoring and assessment. Below is a methodology to help to clarify the process of preparing action plans and timetables to supplement those provided in the reference reading above.

Table A2.1 presents some examples of activities, their duration and the staff responsible for two of the quality goals set for the company. This information can be used to prepare the timetable of activities.

Table A2.2 presents an example of a detailed timetable of activities.

TABLE A2.1
Identification of activities in the action plan

Quality objective		
To modify quality standards to ensure that they meet the demands of the United States Federal Drug Administration and other regulatory authorities		
Chosen strategies		
<ul style="list-style-type: none"> • Through training and technical assistance in GAP implementation and application, establish strategic alliances with suppliers in order to improve their standards and guarantee the safety of products arriving at the plant • Maintain the commitment to quality and safety in all processing carried out within the company 		
Goals for the quality objective		
<ul style="list-style-type: none"> • Ninety percent of the company's procurement is done through producers' contracts 		
Activities		
Description	Duration (days)	Responsibility for execution
<ul style="list-style-type: none"> • Preparing model contracts • Raising supplier awareness of the importance of contract work, and modification of the established model contracts (if necessary) • Establishment of contracts • Selection of suppliers • Training activities • Technical assistance with cultivation 		
Goals for the quality objective		
<ul style="list-style-type: none"> • Ninety percent of the company's suppliers have GAP certification 		
Activities		
Description	Duration (days)	Responsibility for execution
<ul style="list-style-type: none"> • Raising supplier awareness of the importance and principles of GAP • Use of checklists • Preparing GAP application plans for each supplier • Monitoring GAP application • Control of raw materials 		

TABLE A2.2

Complete timetable of activities

Plan activities	1	2	3	4	5	6	7	8	9	10	11	12
• Preparation model contracts	x											
• Raising supplier awareness of the importance of contract work, and modification of the established model contracts (if necessary)	x											
• Establishment of contracts		x	x									
• Selection of suppliers			x									
• Training			x	x	x	x	x	x				
• Technical assistance with cultivation								x				
• Raising supplier awareness of the importance and principles of GAP						x	x	x	x	x		
• Use of checklists						x	x	x	x	x	x	
• Preparing GAP application plans for each supplier									x	x	x	
• Monitoring GAP application											x	
• Control of raw materials												

More subject-specific plans can be based on the identified activities, such as a GAP training plan for suppliers. Even if the goals identified are realistic, the team in charge of preparing the plan should consider carefully the potential administrative, technical and financial implications of the activities planned for each goal. The goals should therefore take into account support from other areas of the company responsible for specific activities. After conducting the activities identified in the plan the next step is to assess the costs and benefits for the company.

Both strategic plans and operational plans should include planning for implementation over time, indicating:

- i. those responsible;
- ii. the areas of the company involved;
- iii. the budget required to carry out the plan.

Appendix 3

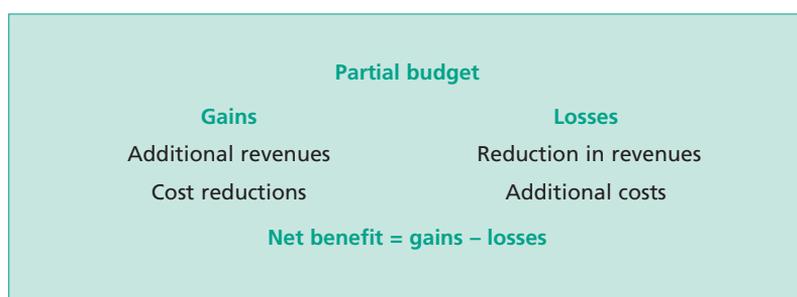
Is the plan financially feasible?

PREPARING A BUDGET

This section provides additional information to enable entrepreneurs to: (i) prepare a budget and cost all the activities of a company and (ii) obtain tools for analysing benefits, cash flows, margins and break-even points.

THE BUDGET

The budget contains a forecast (usually annual) of the revenues and costs for a specific activity. It also provides a basis for studying any potential investments or changes in the company. If the plan (or investment) proposes to establish a new production line, or if it changes radically the manner of producing a specific product, a full budget must be prepared. However, if the proposal is to modify an existing system or process, only the changes that would occur if the plan were implemented need to be examined. A partial budget takes into account only the investment itself and the aspects affected by it, such as additional costs and revenues, as well as any anticipated cost or revenue reductions, as illustrated below (McGillivray, 1998).



The task of preparing a budget for an action plan is facilitated when the activities are clearly defined. Therefore the following steps are required.

Assessment of the resources needed to implement the proposal

Costs

The resources required to carry out the plan must be identified by making a cost estimate for each of the activities in the plan, taking into account activities that are simultaneous and those that are sequential. The required human, physical and financial resources are assessed for each activity (Table A3.1 and Table A3.2).

Once the estimates have been made for each category, they are grouped into coherent financial units, such as: staff costs, administration costs, operational costs (A3.3).

Costs can be classified generally as follows:

Operational costs are direct costs resulting from carrying out the work, some examples of which are:

- raw material and inputs;
- maintenance of production infrastructure;

TABLE A3.1
Calculation of costs

Activity			
Item	Unit cost	Quantity	Total cost
<ul style="list-style-type: none"> • Inputs and materials • Equipment • Services • Transport • Quality control activities 	The unit cost is the cost of a single article or unit, e.g. cost per day, per kilometre, per person	The number of units required for the activity (how many), e.g. five days of training, 100 km travelled per week	Multiply the total number of units by the unit cost
Total cost for the activity			The sum of all the individual costs

TABLE A3.2
Calculation of costs

Plan activities	Description	Unit	Quantity	Unit value	Total
<ul style="list-style-type: none"> • Create supplier awareness of the importance and principles of GAP 	Time of company agronomists and financial staff	Number of days (a)	Number of persons (b)	Cost per day worked (c)	$a \times b \times c$
<ul style="list-style-type: none"> • Visits to companies to prepare contracts 					

TABLE A3.3
Example – Training plan for creating supplier awareness on the topic of GAP

Budget heading	Units	Unit value	Number of units	Total
Training materials				
Paper and photocopies				
Transport costs				
Transport of farmers				
Staff transport				
Food and refreshments				
Staff costs				
Speakers' fees				
Company agronomists' time				
Administrative costs				
Secretarial support				
Mail/telephone				
Total				

- laboratory analysis;
- transport costs;
- costs of training suppliers.

Administrative costs are associated with organizational efforts requiring administration and support to achieve the plan's objectives, such as:

- administrative staff costs (wages, salaries and social benefits);
- rents;
- basic services (water, electricity and waste collection and disposal);
- communications (telephone, internet and other communications);
- office materials;
- vehicles;
- tickets and travel expenses;
- freight;
- maintenance and upkeep of offices, furniture and equipment, except production infrastructure;
- depreciation;
- consulting and advice;
- insurance;
- subscriptions.

Staff costs are associated with product processing staff or with staff involved directly in quality control, supply, sales, distribution and maintenance, as well as administrative and organizational support staff. These costs include salaries and any benefits such as medical services or pension funds.

After calculating the costs, the next step in the budget is to estimate the benefits.

BENEFITS

In most cases, the way to evaluate the benefits of implementing a plan is to assess its impact on the company's revenues. For example, an entrepreneur who decides to invest in purchasing a refrigerated storage room should assess the benefits generated by this investment in terms of:

- the potential extra revenue generated by reduced post-harvest losses;
- the potential extra revenue generated by access to new, more remunerative markets because higher quality products could be offered.

The benefits of a plan may include:

- reducing the time needed to carry out an operation;
- improving the quality of a product or service, generally reflected in higher prices;
- increasing the number of units produced;
- reducing the physical effort required;
- reducing production costs;
- increasing the product's final price.

Therefore, the plan's effects are not always reflected only in the sale price, but also in cost reductions that are considered as a benefit or gain produced by the

TABLE A3.4

Example of benefits

Quality objective
To modify quality standards to ensure that they meet the demands of the United States Federal Drug Administration and other regulatory authorities
Benefits generated
<ul style="list-style-type: none"> • Revenues generated by reducing the number of product returns • Revenues generated by accessing more remunerative markets • Revenues generated by lower transaction costs because there is no need to look for suppliers • Reduction in costs for resolving unforeseen problems (less time wasted on 'putting out fires')

plan. It is important for the entrepreneur to capture all the benefits generated (Table A3.4).

The benefits generated by quality and safety assurance programmes or systems may include:

- access to more remunerative markets;
- efficiency over time by investing fewer resources in resolving avoidable problems;
- meeting requirements, enabling the company to maintain its presence in the target market.

In each of the first two cases the company reaps a direct benefit that will be reflected in revenues, while in the third case the benefit does not translate directly into increases in revenues but ensures the company's sustainability in the market. In these cases, one way of evaluating the plan's benefit would be to estimate the costs of making no changes to quality, that is to say, to assess the implications to the company of not implementing the plan.

CASH FLOW

Another useful planning tool is cash flow management. This is a type of budget that projects all the revenues and expenses according to the periods in which they occur. The results of a cash flow analysis can be of two kinds:

- **Surplus**, which occurs when the expected revenues exceed the expenses, in which case the company will have real cash availability.
- **Deficit**, which occurs when the expenses exceed the expected revenues, in which case the company will need to find cash through one of the following:
 - support from the company's owners;
 - debt;
 - credit from suppliers.

A cash deficit is also known as lack of liquidity. If this situation persists it can lead to the company to financial collapse or bankruptcy. During the planning stages, where cash flow projections indicate future lack of liquidity it may mean that **the plan is not viable**. In contrast, positive balances would indicate that **the plan is viable**. Cash flow is important because it allows the company to:

TABLE A3.5

Cash flow

Activity		Month											
No.	Description	J	F	M	A	M	J	J	A	S	O	N	D
1	Cash in the bank at the start of the period												
2	Petty cash at the start of the period												
3 Cash available at the start of the month (1 + 2)													
4	Cash sales												
5	Payments received												
6	Other cash revenues												
7	Total cash received during the month (4 + 5 + 6)												
8	Total available (3 + 7)												
9 Total cash costs in the month													
10	Cash available at the end of the period (8 – 9)												

- determine whether the company operations will generate sufficient cash to be self-financing;
- determine the cash surplus and forecast the accumulated balances at the end of the year;
- determine the cash deficit, i.e. the cash requirements (both the amount as well as the date when it will be required), so allowing precautions to be taken;
- plan for debt and establish the repayment timetable;
- present clear and precise information to investors, as well as to credit institutions to aid their decision-making.

Cash flow is prepared on the basis of the budget, taking into account the relevant adjustments made to the operations flow chart. Table A3.5 illustrates a cash flow model.

THE BREAK-EVEN POINT

There are a number of indicators for determining the profitability and feasibility of an envisaged change or investment by the company. However, this manual advocates a particularly useful method for analysing the viability of the investment or plan: the **break-even point**. This defines the moment when the revenues generated by the investment or project are covered exactly by the costs, expressed in the form of values, percentages and/or units. This index also shows how great the company profits or losses would be if revenues exceed or were to fall below this point. It is important to estimate the break-even point for the following reasons:

- **It is an important reference point for assessing the feasibility of a plan or investment.** For example, if the break-even point is estimated at US\$100 000 per month, the company will make profits when the real revenues exceed this amount. The more the revenues exceed the break-even point, the greater the

company's profits will be. On the other hand, if the revenues fall below the break-even point, the result will be a loss for the company.

- **It is a planning tool.** It can be used to estimate the effect of changes in the composition of the company's costs and whether they rise or fall in relation to the minimum revenue threshold. For example, if the cost of materials increases or if a new marketing campaign, quality improvements, staff training or an HACCP or GMP system are implemented, **how much must the company's revenues increase to offset the higher costs without affecting profitability?** In other words, what is the new level of revenues and the new break-even point?
- **It is used to assess the feasibility of a new plan.** If the break-even point indicates that the minimum revenue levels cannot be achieved in a relatively short time, which will therefore affect the company's overall profitability, it is probably not advisable to invest in the new project.
- **It supports decisions on whether or not to accept orders.** For example, the company management has to decide whether or not to accept an order for less than the normal price but for more than the variable costs. It will probably decide to accept the order because the incremental sales will help to cover the fixed costs and will eventually bring the company profits.

How is the break-even point estimated?

There are a number of ways of estimating the break-even point. One of the simplest, easiest to understand and most direct is to determine the **contribution margin**. This is the measure by which each unit or product sold helps to cover the total fixed costs. The following arithmetic formula is used to calculate the break-even point:

Revenues = total costs,
or alternatively

Revenues = fixed costs + variable costs

The contribution margin is the difference between the unit sales price and the unit variable costs:

Contribution margin = unit sales price – unit of variable cost

Example for calculating the break-even point

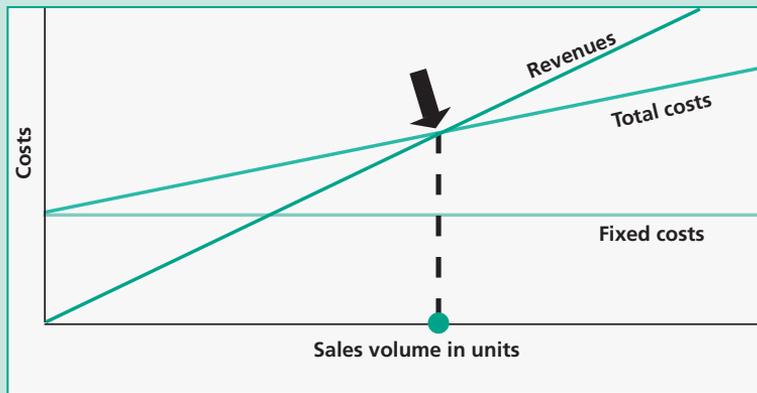
Natur is an agro-industrial company that processes *lucuma* fruit pulp concentrate and sells it in the Japanese market in packages of 40 kilogram (kg) as an ingredient for the manufacture of ice cream.

Although the management has confirmed sales of company production, owing to seasonal variation in raw material supplies, it wishes to know the break-even point. It wants to ensure that the company is not operating at a loss, while at the same time maintaining its business deal with foreign customers. A study of the company has produced the following information.

Information collected:	up to 30 June 2005
Study period:	1 month (22 working days)
Product:	40-kg packs of <i>lucuma</i> pulp
Fixed costs:	25 000 units
Unit sales price:	100 units
Unit variable costs:	60 units

Procedure

- The contribution margin is calculated
 $\text{Contribution margin} = \text{unit sales price} - \text{unit variable costs}$
 $\text{Contribution margin} = 100 - 60 = 40$
- The total fixed costs are divided by the contribution margin
 $\text{Break-even point} = \text{total fixed costs} / \text{contribution margin}$
 $\text{Break-even point} = 25\ 000 / 40$
 $\text{Break-even point} = 625 \text{ units}$
- Checking the total costs
 $\text{Production at the break-even point} = 625 \text{ units}$
 $\text{Total variable costs} = 625 \times 60$
 $\text{Total variable costs} = 37\ 500$
 $\text{Total costs} = \text{total variable costs} + \text{total fixed costs}$
 $\text{Total costs} = 37\ 500 + 25\ 000$
 $\text{Total costs} = 62\ 500$
- Checking total sales
 $\text{Total revenues} = \text{number of units} \times \text{unit sales price}$
 $\text{Total revenues} = 625 \times 100$
 $\text{Total revenues} = 62\ 500$
- Comparison
 At the break-even point, revenues are equal to the total costs

MODULE
4

Source: adapted from *Rural agro-enterprise development project*, Ostertag, C.F., International Center for Tropical Agriculture (CIAT), Colombia, May 2000

Cost-effective management tools for ensuring food quality and safety

FOR SMALL AND MEDIUM AGRO-INDUSTRIAL ENTERPRISES

The purpose of this manual is to improve and build the capacities of small and medium agro-industrial enterprises in order to guarantee the quality and safety of food products. The approach integrates the different factors that affect the capacity of a business to produce foods to meet market expectations and recognized standards, while maintaining and increasing the profitability and life of the business. Management and technical aspects are integrated through a practical and cost-effective approach.

The manual includes four modules on the following subjects: the use of market information for improving quality management; systems and tools for improving quality and safety management in agro-industry; the application of quality management principles in small and medium agro-industrial enterprises; planning as a tool for improving quality and safety management.

The manual contains case studies, exercises and bibliographic references, as well as a trainers' guide, PowerPoint presentations (on CD-ROM), appendices with further reading, links of interest and a glossary. The manual aims to assist trainers and entrepreneurs wishing to use the material for self-learning. With this manual, the Food and Agriculture Organization of the United Nations (FAO) provides the small and medium agro-industry sector in developing countries with an important tool for improving competitiveness and the capacity to deliver high-quality products to consumers.

Module 4: Planning as a tool for improving quality and safety management